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THE CONNECTING SCHOOL: A
QUALITATIVE EVALUATION OF INTRANET
DEVELOPMENT AND THE ROLE OF THE
SCHOOL LIBRARIAN IN SCOTTISH
SECONDARY SCHOOLS

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Abstract

This study investigates the development of intranets in Scottish secondary schools and within that development the role of the school librarian.

There is little written on the development of intranets in schools. There has been a lack of recent research on the role of the school librarian in the UK, and in particular there have been no studies investigating their involvement in ICT. This research adopted an interactionist approach which has been used in studying the social impact of computing (see Hiltz 1992). A grounded methodology has produced original substantive theory. Methods include a questionnaire to Scottish education authorities and semi-structured interviews with key individuals at authority level and in fifteen Scottish secondary schools.

Schools which have successfully developed their own intranets were found to have a supportive culture which enabled key individuals to work on the intranet and develop content relevant to the internal curricular needs and ethos of the school. Examples of materials on the intranet was important in encouraging further content through a snowball effect. The key individuals were defined as activators (people with the technical skills to create content), mediators (people willing to encourage, provide ideas and examples) and to a lesser extent gatherers (who collected content from school staff). A predictive model for intranet development has been produced based on these findings.

There appears to be flexibility within the role of the school librarian for individuals to take on a variety of roles. This research on intranet development found that the librarians who qualified within the last five years focussed on the intranet as a way of developing and promoting their role. Their involvement with the intranet has put school librarians in the role of intranet builder, intranet manager and content creators. Most significantly they have operated as activators and mediators in intranet development. Some librarians have broadened into network administration roles. This is increasing the difference between recently qualified librarians and longer serving school librarians. However it was found that the more recent graduates involvement with these more "technical" roles is not distancing them from their traditional areas of work. There is evidence that through these new roles, close curriculum cooperation has been achieved.

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Introduction

Through the National Grid for Learning (NGfL) initiative the government has forced the education system to face up to information and communication technology (ICT) needs in schools (DfEE 1997a). Authorities have had to provide schools with appropriate ICT facilities. In its publication *Using the Superhighways*, the Scottish Office promoted an intranet as one option for authorities and/or schools to consider in order to meet with government requirements (SOEID 1998a). An intranet can be defined as “an organization’s internal communication system using Internet technology” (Blackmore 1997, p.23).

There is little written on intranets in schools to date. Two national education projects included intranets: the EDSI projects (DfEE 1997b) and Schools Online (DTI 1998). These were projects which were limited in time, using schools which had a high commitment to ICT. By the very nature of being a project they may well have had a greater level of support from staff, pupils and parents than would normally be expected. What they indicated was that the technology involved in an intranet works within a school and that it can aid effective teaching and learning. However there is now a need for deeper assessment of how intranets are developed and used in schools.

School librarians have been at the forefront of ICT in schools. ICT facilities found in School Library Resource Centres (SLRCs) could include library management packages, CD ROM, Internet access and online databases. All of these can be incorporated into an intranet. School librarians have for many years been leading developers of information skills in schools. With the growth of potential information sources available through an intranet, there will be an even greater need for information skills. Librarians have skills in information management, information technology and information literacy. It is not surprising then to find that the intranet has been called “an opportunity for the school librarian” (Clyde 1998, p.36).

This research was restricted to Scottish secondary schools in the public sector which had access to an intranet and which employed a full-time qualified school librarian.

1.1 Research Aims

This study on intranets in Scottish secondary schools addresses two main questions

- What are the key factors affecting the development of intranets in these schools?
- How is the role of the school librarian perceived within an intranet environment?

This research does not focus on the technologies themselves nor on the educational value. It is not intended to investigate whether a school intranet can be successful. Rather it looks at intranets from the perspective of information management – it aims to discover how intranets develop and what and who affects that development. As will be shown this is directly relevant to the role of the school librarian.

This research aims to investigate the potential roles of the school librarian in relation to intranets in secondary schools. It is not intended to say that all school librarians should have a role in intranet development but to find out if and how school librarians are involved and what affects this involvement.

1.2 Research Objectives

There were three main objectives to this research. These were to:

- Develop a predictive model of a school intranet
- Identify the critical roles of the school librarian
- Make recommendations on the future training and education of school librarians.

1.3 Research overview

This research is primarily of a qualitative nature. Constructionism is the epistemology on which this research is based. Crotty writes that constructionism rejects objective truth whilst “truth, or meaning, comes into existence in and out of our engagement with the realities in our world” (Crotty 1998, p.8). It is accepted that different people can construct meanings in different ways in relation to the same phenomenon (Crotty 1998). Grounded theory is an inductive methodology, ideal for exploring new areas of research and which importantly allows the researcher to come to the data without preconceived theories (Glaser & Strauss 1967). Grounded theory fits with the constructionism epistemology as systematic data on a phenomenon is obtained through interviewing key participants, where they can relate their understandings of the phenomenon in question in their own words. To explain how the intranet was developed and used, the views of key people involved in that intranet development were sought in a range of schools. These key people were questioned on the

involvement of the school librarian within the intranet environment. It is the words and understandings from these individuals which provides the evidence upon which the theory in this research is constructed.

The grounded approach built on the literature review, discussions on list serves, informal visits to schools, informal visits to education authorities and phone calls to Scottish education authorities. A questionnaire was then sent to all Scottish education authorities. The main body of research involved three sets of interviews at authority level and concluded with interviews in fifteen Scottish secondary schools. Substantive theory was developed from ongoing inductive analysis of data using a grounded theory approach.

1.4 Methods

a) A questionnaire was sent to all thirty-two Scottish education authorities in January 2000. This provided the essential information of which authorities were providing schools with intranets and indicated time of implementation. This was critical for the next stage of research - the interviews in schools. The questionnaires identified the level of support given by authorities (by the amount of training, policy guidelines, technical assistance etc). From the responses three authorities were selected for deeper investigation.

b) Semi-structured interviews (Patton 1987) were held in three authorities with the intranet development officer and heads of School Library Services.

c) Authorities providing intranets in schools were identified from the questionnaires. Semi-structured interviews (Patton 1987) were conducted in fifteen secondary schools across seven different authorities. The interviews were generally held with a member of senior management, ICT co-ordinator and school librarian.

1.5 Analysis

Data from questionnaires was analysed using Pinpoint software. Data from the authority and school interviews was analysed using comparative analysis, essential for the grounding process (Strauss & Corbin 1990) and with the aid of NUD.IST software. Comparisons were made within each school and then across schools.

1.6 Personal interest

The literature on research methods identifies researcher bias as a potential danger to validating qualitative research (eg Miles & Huberman 1994). To counter this it is suggested that the researcher should be open about their background and be aware of any potential sources of bias (Patton 1990). To this extent it should be noted that the researcher spent ten years working as a school librarian, where she had a particular interest in developing ICT. The researcher did not introduce herself as a school librarian, but as a research student at Queen Margaret University College. In five schools the researcher was already known to the school librarians as a former colleague (1, 7, 11, 13, 15) and through her involvement in the NOF (New Opportunities Fund) training of school librarians (7, 11, 13). The researcher was also known to one ICT co-ordinator (School 7). It is not believed that this biased the data collected from these interviews.

1.7 Original contribution to knowledge

This research is original in that there are no in-depth studies of intranets and the role of the school librarian. The research adopted an interactionist perspective for studying the social impact of technology. This approach used in conjunction with grounded theory has produced original substantive theory on intranet development in Scottish secondary schools and the role of the school librarian. The objectives were met through

- **Development of a predictive model of a school intranet**

This emerged as the data collection in schools proceeded. This model outlines four stages of intranet implementation with a range of criteria to identify each stage. This model should be of value to those who are planning and implementing a school intranet.

- **Identification of the critical roles of the school librarian**

From an analysis of the data the key roles of the school librarian were identified. This analysis could be utilised by education authorities, schools and School Library Services in reviewing the role of the school librarian in relation to intranets.

- **Recommendations**

Following the identification of the role of the school librarian within the intranet environment recommendations are made for

- The future education and in-service training of school librarians
- School Library Services
- Local education authorities

1.8 Structure of this thesis

Chapter 2 consists of the literature review starting with an outline of the education system in Scotland. This framework was a consideration in the decision to restrict the research to Scottish schools. The educational context for the role of the school librarian is then given. The literature review progresses to detail the role of the school librarian with relevance to intranet technology. Chapter 3 provides the methodological context for the research. Chapter 4 outlines the findings from the questionnaires. This is followed in chapter 5 by the findings from the authority interviews. Chapter 6 is the main body of findings on intranet development from the interviews in schools. The findings on the role of the school librarian are presented separately in chapter 7. Presentation of theory follows in chapter 8. The final chapter provides conclusions, synthesis with literature, the meeting of objectives and suggestions for future research.

2 Literature Review

Initially the literature review focussed on the role of the school librarian (search terms school librarian, school library: + intranets: + technology). Searches were carried out on Library and Information Science Abstracts (LISA), British Education Index and Educational Resources Information Center (ERIC). Visits were paid to the National Library of Scotland which held a great deal of research reports related to school librarianship in Scotland. The literature search was then widened to include learning theories, educational change and management information systems in schools (British Education Index). As the study progressed it became apparent that this research would be further supported by investigating the literature on intranets in organisations with the broader field of implementation of technology in organisations (search terms; intranet + implementation: technology + implementation). Searches were carried out on ArticleFirst and Emerald.

This research focused on publicly funded Scottish secondary schools. A survey of documentation on Scottish education provides reasons for limiting this research to Scotland and reveals issues relevant to both the development of intranets in schools and the role of the school librarian.

2.1 Education in Scotland

Compulsory education in Scotland is provided to those aged between 5-16, though many pupils choose to stay on at school until the age of 18.

Professionals in Scottish education take for granted a Scottish framework (Paterson 1997). Within Scotland there are thirty-two authorities. Each has a Director of Education and an Education Committee (Clark 1997). The Scottish Education Acts cover the organisation and administration of education (SOEID 1997). The Scottish Executive Education Department and Scottish Executive Enterprise and Lifelong Learning Department administer education and training policy in Scotland (previously administered by SOEID). With the exception of religious education, the curriculum is not governed by legislation (SOEID 1997). The Scottish Consultative Council on the Curriculum (SCCC) merged in July 2000 with the Scottish Council for Educational Technology (SCET) to form Learning and Teaching Scotland. This new partnership is responsible for guidance on the curriculum for 3-18 year olds but in addition has a role in promoting

“creative and effective use of information and communication technology in education and in learning throughout life”
(Learning & Teaching Scotland, Mission statement, 2001).

Information and communication technology (ICT) is closely linked to the whole of the Scottish curriculum.

A number of features are frequently referred to in the literature on Scottish education. These will now be discussed.

2.1.1 Scotland's unique education system

There is strong emphasis on the fact that Scotland has its own education system which is unique and different to the rest of the UK (Mackenzie 1994). Historically it has been observed that Scotland has a broad based curriculum (eg British Council Scotland 1998; Harrison 1997a). This has been considered something to be proud of in preparing students for a diverse workplace. Yet the *Howie Report* showed that Highers taken by pupils were of a narrower range than many presumed (SOED 1992). Another generalisation frequently made is that the education system in Scotland is better than that of the rest of the UK. Yet the major overhaul of the whole Scottish curriculum in the last twenty years would suggest that there was much to criticise.

2.1.2 The Scottish Curriculum and the School Library Resource Centre

It is the changes in the curriculum which are considered responsible for increasing the difference between Scotland and the rest of the UK (Clark 1997). These changes will now be reviewed and key aspects identified in relation to their effect on school libraries and possible relationship with intranet development.

2.1.2.1 Standard Grades

Significant change to the curriculum came in 1974 when the government commissioned two reports: The Munn Report *The Structure of the Curriculum in the Third and Fourth Years of Scottish Secondary Schools* (SED 1977a) and the Dunning Report *Assessment for all* (SED 1977b). Standard Grades based on the Munn and Dunning proposals, were implemented by the Scottish Office and HMI in 1979. There were three significant changes:

- The exam could be taken on three levels: Foundation, General and Credit
- Inclusion of internal assessment
- Part of the course would be project led through investigations.

These investigations involved a new approach to the learning process (Murdoch & Dunning 1993). The traditional broad curriculum was kept but emphasis was given to the skills of learning rather than acquisition of knowledge alone. It is this new approach to learning which impacted on the SLRC.

The SLRC is a place for pupils to practice their new skills. Yet an examination of the effect of Standard Grade on school libraries found little evidence of collaboration between subject teacher and school librarian (De Silva 1989). Instead Standard Grade encouraged departments to build their own collections of materials. There is a lack of reference in educational writing on the involvement of SLRCs and impact of Standard Grade investigations. McPherson commenting on the preparations in public libraries for the updated Higher examinations remarked

“The unpredicted and overwhelming flood of demand released by the introduction of Standard Grade is still for some of us a vivid memory: a repetition of this experience would not be welcome”
(McPherson 1998, p.20).

The quote hints at the suddenness and scale of the change, of the fact that libraries were caught unprepared and had not been consulted. This implies that educationalists had no idea that changing the curriculum would affect not only school libraries, but public libraries and the vast number of public bodies and charities which now found themselves overwhelmed by requests from pupils for information.

2.1.2.2 SCOTVEC Modules

The publication of *16-18s in Scotland: An Action plan* heralded the introduction of modules and provided a link with further education (SED 1983). Both schools and further education colleges could offer the National Certificates awarded by SCOTVEC. The shift in learning style can be seen with the modular system encouraging a student centred approach.

2.1.2.3 5-14

It was now the turn of early years education in Scotland to see change with the publication of *Education 10-14 in Scotland* (CCC 1986) followed by the consultative document *Curriculum and Assessment in Scotland* (SED 1987). The main points from these are:

- to improve progress from primary to secondary school
- a more consistent approach to assessment
- better communication with parents
- address policy for the curriculum.

Communication between secondaries and their local primaries and between school and home was emphasised. The use of an intranet could support this. Standard assessment sheets available to staff via the intranet could aid with reporting. Schools are expected to provide twelve standard subjects but Computing and Business Education are not compulsory for the S1 and S2 curriculum. It is up to individual schools whether they provide these or not (SOEID 1997). This could well influence the information skills policy within a school and be relevant to the use of the intranet.

2.1.2.4 Higher Still

The Highers were the latest section of the curriculum to be updated. The *Howie Report* was translated into *Higher Still*, subtitled *Opportunity for all* (SOED 1994). This brought the old Highers, CSYS, the Scottish Exam Board short courses and National Certificate modules into a single system.

As with Standard Grade, differentiation was addressed by giving five levels of access: Access, Intermediate 1 and Intermediate 2, Higher and Advanced Higher. Progression is an important element of the new Higher. The aim of Higher Still is that pupils study a subject at the correct level and acquire a recognizable qualification.

Core skills are now embedded into courses. These are:

- Communication
- Numeracy
- Problem solving (critical thinking, planning and organizing, reviewing and evaluating)
- Information technology
- Working with others

(Learning & Teaching Scotland, Higher Still website).

These core skills

“enable individuals to put their knowledge and understanding into action. They underpin and promote the development of learning and study skills, and provide the basis of learning throughout life”
(SCCC 1996, 2.6).

The learning and study skills have not been identified as core skills on their own but should underpin other core skills. The emphasis on technology is a factor which could potentially affect both intranet development and role of the school librarian. In implementing intranets, authorities may feel that they have to provide the technology in preparation for Higher Still. As with Standard Grade there is more internal assessment as part of certification.

Following a training day on Higher Still, Thomson highlighted a number of issues for the school librarian.

- Greater input into subject development and curriculum support
- Increased library use-due to flexible learning style
- Greater use of computers in the library- due to emphasis on technology use
- With this an increased demand for access to websites, CD ROM etc
- May be a need for more flexible opening hours, library assistants and funding for technical equipment and training

(Thomson 1999).

This can be seen as a continuation of changes that have occurred with previous curriculum development. As is necessary with any new course, school librarian input into resource provision is required. As in Standard Grade a change to the teaching methods could also be expected to affect the use of the SLRC, both in terms of flexible learning and increased emphasis on ICT. Because it affects senior pupils there is the possibility of more pupils working on their own, perhaps undertaking courses taught at other schools. Where will they work? Will there be increased pressure on the SLRC requiring both supervision and help in accessing networked learning resources? It is not yet known what the effect on the school librarians' time or on scheduled library classes will be.

Unlike previous curriculum changes in Scotland a working group involving a Senior Field Officer for Higher Still, School Library Officers and school librarians was set up to look at the implications of Higher Still (Inglis 1999). Amongst their aims was clarifying the role of

the school librarian, identifying subject experts and disseminating information to school librarians through websites. This potentially was an important development. However to date there has been a lack of feedback into the Scottish school library community.

2.1.3 National educational issues affecting the School Library Resource Centre

There are a number of developments that are not particular to Scotland. Those, which could affect the way in which a school decides to develop and use its intranet, are reviewed here.

2.1.3.1 Parent/Community involvement

One trend has been the greater involvement of parents in schools whilst taking more account of their views (Watt 1994). Parents have been given greater choice in selecting a school for their child through the Parents Charter in Scotland, (SOED, revised 1995). They have been encouraged to become more involved in the running of the school through School Boards (SOED, 1988). The publication *School and its Community* (SOED 1990) encouraged schools to consider their public image and to respond to the needs of their community (Watt 1994). The intranet as a communication medium has the potential to be a tool for extending parent and community support.

2.1.3.2 Devolved management

Devolved management has occurred across the UK as in other countries such as US, Australia, New Zealand and Denmark (Munn 1997). It was introduced in 1993 and fully devolved in 1998. As with School Boards devolved management has reduced the influence of local education authorities. The head teacher now has more responsibility for both the financial running of the school and staffing of the school. This has implications for funding of School Library Resources Centres. The Chartered Institute of Library and Information Professionals (CILIP) produces figures with recommendations for School Library spending but the decision is up to the head teacher. An intranet with increased ICT in the School Library Resource Centre could have budget implications for the supply of the technology, purchase of CD ROMs, subscriptions to online resources and for the mundane but necessary paper and printer supplies. There is the possibility that the intranet could mean less money for bookstock if it was considered that information was available via the Internet and the intranet. The head teacher will also be responsible for funding extra clerical or library support which may be necessary through librarian involvement with the intranet.

2.1.3.3 Making schools more accountable

There has been a drive by governments to make schools more accountable. The emphasis on “audits”, “targets” and “outcomes” have not been welcomed by all as it does not necessarily address the central issues of learning and teaching (Boyd 1997). In Scotland there are a number of ways in which accountability is addressed.

1 HM Inspectorate of Education (HMIE), formerly known as the HMI. They carry out school inspections which includes the SLRC and publish the reports. Revised Guidelines for HMI inspection of School Libraries appeared in August 2000 and includes provision of ICT (SLAINTE 2001).

2 Schools self-evaluation, the use of performance indicators updated to quality indicators in *How good is our school* pack (SOEID 1996, note updated HMIE 2001), the school development plan and exam results have all encouraged a culture of self-evaluation (Boyd 1997). It has been claimed that it is the HMI’s commitment to self-evaluation in schools which makes Scotland different to the rest of the UK in the goal of school improvement (Boyd 1997). The development plan, which must be provided by every school, can be viewed as a method of consulting with all staff and to some extent the wider community in terms of shared priorities (McGettrick 1994). The performance indicators, of which there is now a set for the School Library (SCCC 1999), should be an important aid in putting together these reports.

2.1.3.4 Homework and supported study

Councils have been encouraged to develop supported study schemes in schools (Commission on Scottish Education 1996). Access to the school library may be part of this. It is possible that an intranet may be seen as a way of supporting this.

2.1.3.5 Lifelong learning

There has been a national emphasis on lifelong learning as something which will continue after formal education. Schools have a role in making pupils aware of lifelong learning opportunities and to see learning as a way of improving their life choices (SOEID 1998b).

2.1.4 Conclusions on the educational context

This chapter has outlined the specific educational context in which this research took place. It can be seen that the whole of the Scottish secondary education system has undergone

change with many years of continuous upheaval for teachers and pupils. The consequence of this is that

“Secondary education is suffering from innovation fatigue, an ageing workforce and a chronic and deteriorating shortage of resources”
(Raffe 1997, p.76).

The Commission on Scottish Education (1996) likewise stated that there is a real need for a period of consolidation. At the time of this research, schools were starting Advanced Higher, recovering from the exams results fiasco of 2000 and implementing the National Grid for Learning (NGfL). The intranet is not a curricular innovation as such but is a technological innovation which may not necessarily be welcomed by all.

The review of the literature on Scottish education suggests that there may be curricular encouragement to develop intranets in schools (changes to the curriculum with greater emphasis on ICT, information skills and independent learning). The intranet could also be developed in response to the wider needs of the schools community as a way of encouraging parental involvement and building school ethos. How the school responds to the purpose of the intranet will be reflected in the way in which the intranet develops and the use that is made of it.

There is little evidence in the literature on the Scottish curriculum that educationalists have given much consideration to the role of the school librarian. A major work which “endeavoured to provide a definitive text on Scottish education,” (Bryce & Humes 1999, p.14) failed to have a chapter on school libraries. At just over 1000 pages and with 112 chapters it is disappointing not even to find a reference to school libraries in the index. This would suggest that it may be difficult for school librarians to contribute to developments in relation to intranet innovation.

2.2 Learning, teaching and the school as a learning community

In order to understand the context of why the curriculum has changed and how this has impacted on the SLRC, it is necessary to understand theories related to learning and teaching.

2.2.1 Learning

The term “learning” has become prevalent throughout our society. The government has initiatives for “lifelong learning” and we talk of a “learning society.” Businesses have an interest in the “learning organization.” Within education itself there has been a change of emphasis from teaching to learning and that move can be traced to the development of different learning theories.

Learning is accepted as involving

“the acquisition of new elements of knowledge, skills, beliefs, feelings and specific behaviours, as well as change in existing elements”
(Hohn 1995, p.7).

Learning is more than memorisation and must involve some sort of understanding. It is a process which comes through practice and experience and is differentiated from development which is viewed as a natural progression.

A number of learning theories have influenced education over the years.

2.2.1.1 The Behaviourists

Behaviourists, predominantly Skinner, Bloom, Pavlov and Thorndike, were amongst the earliest theorists of learning. Their theories frequently evolved from the study of animals. Entwistle outlines 3 main elements to Behaviourist theory.

- Contiguity- the connection between stimulus and response eg cat and --- dog
- Repetition. Reinforcement would be used until something is learn
- Law of effect. Such as rewards, privileges and approval for correct responses.

(Entwistle 1987, p.7).

The following criticisms have been made of Behaviourist theories.

- Too much emphasis on the teacher, who is in control of the learning
- No indication of understanding
- Encourages rote memorization and has been viewed as simply a form of knowledge transfer
- Learning in small steps may suit some subjects but not all eg maths and science
- No account is taken of ability, motivation or external social factors

(from Entwistle 1987 and Inglis, Ling & Joosten 1999).

But the main criticism aimed at the Behaviourists is that it is too simplistic an approach to learning.

2.2.1.2 The Constructivists

Where the Behaviourists viewed learning in terms of memorisation of facts or skills the Constructivists saw it in terms of a change in perception (also referred to as information processing or cognitive theories). There has to be new understanding.

Piaget believed that children progressed through different stages in a sequential manner and developed the idea of the child as an active learner making sense of experience by relating what they had learnt to what they already know (Kyriacou 2001). Piaget's stage theory was later seen as too simplistic as it was found that children could develop at an earlier stage in the right environmental conditions (Kyriacou 2001).

Ausubel used the term "schemata" to describe how information is organised within the mind (Kyriacou 2001). New material is added to our existing knowledge or schemata. For effective teaching to take place the aim is for meaningful learning and thus the need to create links with existing knowledge and experience. Some children's schemata may be incomplete, unclear or wrong (Entwistle 1987). Questioning of children is necessary and Ausubel uses the term "advance organisers" to describe how this is done (Kyriacou 2001). These "advanced organisers" are ways in which teachers can show pupils how what is to be learnt can be related to their previous knowledge and made as meaningful as possible (Kyriacou 2001).

Different constructivist theorists debate the conditions in which such learning is optimised. For Vygotsky learning is more dependent on social interaction and experience (Bourne & Moon 1994). Learning is seen at its greatest in the classroom where social interaction is

encouraged between a learner and a more knowledgeable other (Bennett & Dunne 1994). Where Piaget emphasised the individual and then social interaction between children of similar ages, Vygotsky's approach is one of "social guidance" from the start (Rogoff 1999). Vygotsky also differed in linking traditional didactic teaching with discovery learning as explanations are still necessary and should precede the discovery approach.

2.2.1.3 Experientialists

The experientialists emphasized the learner experiencing and analysing their learning. Freire and Dewey encouraged the participation of the learner in selecting the issues to be examined (Withall 1991). For Rogers the learners should be "learning how to learn" and be clear about the purpose of learning (Wittrock 1991). Teachers are seen as facilitators but Rogers also emphasized the teacher as learner (Wittrock 1991). These theorists saw a move from teacher centred education to learner centred education.

2.2.1.4 Learning styles

Hohn referred to the influences on intelligence as learning styles. These he defined as "beliefs, preferences and behaviours used by individuals to aid their learning in a given situation" (Hohn 1995, p.97). Books on learning theories indicate that there are many different ways of classifying and describing learning preferences (eg Dryden & Vos 2001). It would be impossible for a teacher to accommodate each pupil's individual learning preference and students may in fact need to adapt to a variety of learning situations.

2.2.1.5 Study skills

Study skills are now accepted as important to pupils' learning. It is also agreed that teaching of study skills on their own may have little influence. They must be related to the purpose and the outcomes of learning and be taught within different subjects (Entwistle 1987). Research in recent years has shown that pupils' learning can be improved if they are helped to think about how they learn (Cox 1999).

2.2.2 Teaching

Teaching is not simply a transmission of information or a delivery system (Hounsell 1984). Teaching itself is active. Subject knowledge is obviously required but does tend to be overlooked (Williams 1999). Subject knowledge pervades decisions in planning, organising and assessing the lesson. A key feature of the successful teacher is the ability to adapt, be

flexible and change to meet the demands of the moment (Learning & Teaching Scotland 2000).

The teacher, once regarded as the font of all knowledge, has now moved to a facilitator's role helping people to learn effectively (Jarvis, Holford & Griffin 1998). Questioning and discussion are key elements of the teachers skills set. The term "scaffolding" is commonly used to explain the support teachers must provide. The teachers' ability to motivate pupils is central to the learning process. Schools are encouraged to develop a "culture of achievement" (Learning & Teaching Scotland 2000, p.4). The HMI calls for schools to have high expectations of learners (Kyriacou 2001).

Discovery learning involves more group work and experimentation. Investigations require access to a range of resources with possible paired or individual study. Experiential theories require different teaching strategies such as the organisation of the room to encourage face to face discussion, encouragement from the facilitator of student questions and a student lead in discussion.

The changes in the curriculum discussed in the previous chapter have challenged teachers to consider different methods. According to Kyriacou (2001) most teachers use a mixture of exposition and activities such as group work or project work. This is supported in Scotland by the fact that much of the literature from the Scottish Office Education Department recommends variety with no single style or approach seen as best. Ultimately the choice of teaching method should be chosen as appropriate for the learning context.

"The basic task of effective teaching is to set up a learning experience in which pupils effectively engage in the mental activity that brings about these changes in the pupils' cognitive structure which constitute the desired learning"
(Kyriacou 2001, p.39).

The use of the intranet and of networked information resources will be contingent on meeting the needs of the learning activity, of the various technical resources available to support the teacher (eg how many computers in the classroom, the availability of a computer suite or SLRC) and also the teacher's own capabilities.

The Commission on Education in Scotland states

“... School resource centres should be developed into places of independent learning where pupils can construct and control their own learning under the guidance of teachers and other qualified professional staff”
(Commission on Scottish Education 1996, p.43).

This establishes a context for the School Library Resource Centre.

2.2.3 The school as a learning community

The government is keen to emphasise that learning does not end in the school but that the strategies for learning can be developed for future life. Senge is generally credited with popularising the concept of the learning organisation (Fenwick 2001). Senge argued that decisions could no longer be made from the top of organisations and that “learning organisations” would be distinguished from the traditional organisations by the mastery of five basic disciplines (Senge 1992). These disciplines require individuals to make a personal commitment to learning (personal mastery), to recognise how they fit into the organisation (systems thinking), to scrutinise how they understand the world (mental models) and to have a common sense of identity (building shared vision) which comes through dialogue and working with others (team learning). Senge places emphasis on “fostering” the culture of learning. However Senge was principally writing for the business world. Critics of the learning organisation have suggested that it is difficult for such organisations to have a united vision and questioned who controls the vision (Fenwick 2001). The principles of the learning organisation have never-the-less filtered into educational theory and generated a great deal of discussion. However there does appear to be a preference for the metaphor of the school as learning community over learning organisation (Sergiovanni, cited in Retallick 1999). Retallick reviews the literature on learning communities (1999). Amongst the key features identified are

- A recognition that they are creating something new and different to what has gone before
- An acceptance that everyone is a learner
- The need for dialogue between teacher and pupil and between teachers
- An emphasis on constructivist learning
- Teachers must want to learn if they are to change their practices
- There is no single recipe for community building.

The themes of shared vision and working together can also be found in Scottish education

“Successful schools are those which work together to develop a joint sense of purpose....and are prepared to act together to get things done”
(Learning & Teaching Scotland 2000, p.27).

Externally imposed innovations have been shown not to work (Fullan 1982). In educational change there is a need for a clear model for proposed change and a shared vision of how to get there (Fullan & Stiegelbauer 1991).

2.2.4 Conclusion on learning, teaching and the school as a learning community

There are a number of theories which have influenced ideas on learning. It is important to recognise that although individuals may have different learning styles, learning is cumulative, socially constructed and for life. Teachers are being encouraged to look at themselves as learners whilst the school is now viewed as a learning community. Within schools the learning and teaching environment will be significant where the intranet is considered a curricular tool. The introduction of the intranet, an innovation, may itself be influenced by how the school as a community tackles change.

2.3 Information and communication technology in education

An outline will be given of key initiatives in education relating to information and communication technology (ICT). The following section will draw together the different viewpoints of ICT in education and link this to the learning theories of the previous chapter. The final section will discuss factors highlighted in educational research studies involving ICT which may have relevance to the introduction of intranets in secondary schools.

2.3.1 Background

The current push to network schools and link them to the Internet can be traced back to 1995 and the launch of the “Superhighways for Education” initiative by the then Conservative government (SOEID 1998a). The Education Department’s Superhighways Initiative (EDSI) involved a series of pilot projects to investigate the effect of ICT on learning and on professional development and training in education (DfEE 1997b). The subsequent Labour government has been equally committed to the development of ICT. The findings of the Stevenson Committee and the McKinsey report led to the government’s consultation paper *Connecting the Learning Society* (DfEE 1997a). This provided a framework for a “Learning Grid for Education” based on Internet access. Known as the National Grid for Learning (NGfL) it aimed to connect all UK schools to the Learning Grid via the Internet by 2002 (DfEE 1997a). The Scottish Office conducted its own consultation. The responses were supportive of the proposals, confirming the view “that the proposed Grid would result in enhanced teaching and learning” (SO 1998, Intro). The publication of *Scottish schools: Using the Superhighways* placed the NGfL within a Scottish context (SOEID 1998a). It suggested a variety of responses to the NGfL, from an initial connection to the Internet, a whole school network or an education authority initiative. Either of the latter could include an intranet. This Scottish Superhighways publication can be viewed as a first step, practical guide to aid education authorities and school management make decisions about what they plan to do and how to go about it. Within this publication ICT was seen as an educational tool but there was also a strong emphasis on the use of ICT for management and administration.

The importance of these initiatives is that they are driven by government and are part of a national agenda to integrate information and communications technology into teaching and learning. This commitment continues with further government investment and targets for e-learning (use of digital resources and activities) (DfES 2002).

2.3.2 The EDSI PROJECTS

The basis for much of the development of the NGfL is drawn from the findings of the EDSI projects. A total of twenty-five projects were involved in EDSI, involving over a thousand schools throughout the UK. Most of the projects ran for two years. Each involved a combination of three forms of ICT related to use of the information superhighway.

- Accessing resources (eg Internet, CD ROM, cable tv, interactive tv)
- Creating resources for access by others
- Electronic communication (eg email, video conferencing, text based conferencing/discussion)

(DfEE 1997b, p.7).

The aim of the projects was to look at how the new information superhighway could contribute to learning. The final report lists six main effects on learning found in the projects. These were

- Improved subject learning
- Development of network literacy
- Improved vocational training
- Improved motivation and attitude to learning
- Development of independent learning and research skills
- Social development

(DfEE 1997b, p.7).

This was in addition to many indirect benefits of ICT and would therefore seem to be a strong argument for the educational value of ICT. But the projects had differing levels of success. Email, fax, text-based conferencing and Internet sites (used for accessing resources) and CD ROM were among the most successful. In the right circumstances a number of technologies proved to have some educational value- web pages and sites being produced by learners, an open integrated learning system and video conferencing. Some projects such as text based discussion and interactive television failed to prove their educational worth.

Many recent initiatives have focussed on the Internet. The EDSI projects as a whole stated that the Internet was “already clearly a viable classroom resource for general use” (DfEE 1997b, p.19). One of the main projects on the Internet was the Educational Internet Service Providers (EISP) project. Four schools were given Internet connections via ISDN 2 lines. An additional 250 schools with Internet access became involved in investigating the extent

of Internet use in schools. What they found was that there was actually very little use being made of the Internet in most of these schools. The reasons were:

- Ignorance of any knowledge of Internet connection in the school
- Concerns about telephone charges
- Problems of access
- General lack of awareness of any benefits of electronic communication systems or information retrieval

(Selinger 1998).

There was an assumption in the projects that if the technology was available and staff properly trained and knowledgeable of the potential, then the Internet would be successfully used (as in the four main schools in the project). A Scottish study of teachers found use of email and the World Wide Web low despite the fact that over 60% of Scottish secondary schools at that time did have access (RGU 1998). Access in the school and access in the classroom could of course be quite different. This report stated that there was staff interest and motivation to use ICT but that in actual fact word processing was the most commonly found form of ICT use. No reports or projects state that the Internet or email cannot benefit education yet it would seem that teachers may still have to be convinced of the value of the Internet to their teaching.

The Synoptic Report was careful to provide prerequisites for use of the Internet (DfEE 1997b). Teachers should set clear and well structured tasks to avoid aimless browsing and there is a need for the teaching of information and handling skills (DfEE 1997b, p.19). One of the cross project observations from the EDSI projects referred to the importance of the role of the teacher in “using on-line resources alongside others in integrated ways” (DfEE 1997b, p.91). Teacher training with emphasis on the integration of ICT into teaching for sound educational reasons appeared to be one of the keys to success.

The EDSI projects were deliberately set up to encourage a range of commercial enterprises to become involved with education. The schools involved in EDSI were given a certain level of support by local teams. The findings suggested that schools would need to continue to have such levels of support to make use of the technologies. It was clear that local and national networks were necessary to support the infrastructure and ensure that all schools could benefit.

2.3.3 Libraries of the Future Project

Funded jointly by the National Council for Educational Technology (NCET), British Library Research and Development Department and education departments of Northern Ireland this project investigated the results of placing a range of technology in schools and colleges. The research took place from 1994-1996 before networking of schools had started. It was found that ICT did change roles for both teachers and librarians (NCET 1996). Both took on more “flexible” roles as they could each in turn be a gatekeeper, facilitator, demonstrator, guide or team worker. This was at a time when teachers and librarians had little ICT experience and some pupils were as advanced “technically” as the teaching staff. The importance of teaching style appeared significant. What the research found was that ICT encouraged different models of teaching and learning with a move towards team teaching.

It was stated that a number of the problems that they faced would not be found within a networked school. The problems of lack of access by teachers in the classroom, expensive on-line time and the need for pupils to save work to disk could be resolved with a network (NCET 1996). This re-iterated the findings of the EDSI projects that schools accessing multimedia and the Internet require a fully networked environment.

2.3.4 The debate on the value of ICT to education

The above projects suggested that schools should have access to a network if staff and students are to benefit to any great extent from ICT. For this to happen it has required the involvement of the government in order that all schools benefit equally. It has been shown that technology provision throughout UK schools has previously been uneven (McKinsey 1997). It is also clear that the government had expectations for the NGfL which went further than value to education.

This has allowed critics to say that the Information Superhighway has been developed not with education in mind but economic prosperity and the needs of government, business and industry (Selwyn 1998). There is clear evidence in the literature on the National Grid for Learning that the government viewed it as a way of boosting industry and tackling social inequality. It is the Prime Minister who in the introduction of the government’s consultation paper stated that education is “key to helping our businesses to compete and giving opportunities to all” (DfEE 1997a, Foreword).

The aims of the Grid were

- “for new technologies to raise educational standards”
- “to improve quality of life”
- and improve “Britain’s international competitiveness”

(DfEE 1997a, p.3).

It has been stated that there is little proof that quality of education will improve Britain’s economic performance and it may only be one of a number of prerequisites including social division and social disadvantage (Trawler 1998). Similar criticisms can be found of the introduction of computing in education by the American government (see Apple 1992).

Concerns in the literature relate to both the speed of ICT developments (eg Trawler, 1998; Selwyn 1998) and the fact that it is often unclear what the educational reasons for introducing information technology are (Russell 1995; Conlon 1997; Selwyn 1998). Russell cites Maddux who said that nothing miraculous happens as a result of putting a child and a computer in the same room (Russell 1995, p.2). In the early 1990s Computer Studies was regarded as a separate subject. The influence of IT on the content and structure of the curriculum at that point was negligible (Wellington 1990). This is no longer the case. As was pointed out in the previous chapter the changes in the Scottish curriculum, notably 5-14 and Higher Still, require ICT as a core skill and should ensure that it is firmly embedded in the curriculum. Since the introduction of the NGfL the BECTa schools of the future series has continued to produce reports which have found links between ICT and attainment (BECTa 2002).

But is there a theoretical basis for introducing ICT into learning? The learning theories of the previous chapter will now be looked at.

2.3.4.1 Behaviourist theory

Skinner is said to have viewed the computer as “the ultimate teaching machine” (Hohn 1995, p.133). The influence of Behaviourist theory can be seen in the early “Drill and Practice” programmes (Hohn 1995). Features of this software which fit Skinner’s theories include

- Clear objectives
- Progression in an incremental fashion
- Ability to give immediate feedback

These programs suit the view of education as teacher dominated and learning as the gaining of fact. Students using these type of programmes receive immediate feedback, which can be rewarding. Others have criticised them for lowering motivation as there is a tendency for these programmes to concentrate on lower level cognitive skills (Underwood & Underwood 1990). The long term effect of their use is unknown. These programmes give little indication of the process involved in achieving the answers. Therefore the level of understanding is difficult to measure.

2.3.4.2 Cognitive or Constructivist theory

Piagetian theory where children construct new learning through discovery has influenced development of more open-ended programs and offered choices to students (Crook 1994). Forms of computing which lend themselves to constructivist theory are simulations, spreadsheets, databases and word processing. Although these are tools which can provide students with general ICT skills and could be used for active independent learning, they have also been criticised for limiting use of higher cognitive skills (Chandler 1992). Chandler pointed to how it is easy to change a word or sentence using a word processor but much harder to “introduce radical structural changes” (Chandler 1992, p.180).

2.3.4.3 Social constructivism

Crook (1994) advocated a “socio-cultural” theory to the use of computers in education. The influence of Vygotsky can be seen when Crook advocates “collaboration” and social interaction as important. The teacher’s role has been highlighted by a number of research projects which have investigated the “collaboration” taking place at the computer. This emphasis on the centrality of the teacher is another similarity to Vygotsky. In the Spoken Language and New Technology (SLANT) project children were video-taped at the computer and were shown not to be collaborating effectively (Wegerif & Dawes 1998). As was shown in the Libraries of the Future Project this can call for changes in the teaching model (NCET 1996). Crook argued that “collaboration,” ie where children articulate and explain their thinking to the teacher and class, is beneficial to the cognitive process (Crook 1994). Motivational aspects of working together and resolving problems through discussion can be productive. The teacher has a key role in setting suitable tasks, managing the work at the computer and controlling the learning through collaboration (Crook 1994).

Teachers also need to instruct pupils on how to collaborate when networking, using email and talking to experts (Scrimshaw 2001). In these situations the teacher’s contribution to

group discussion will be quite different to that of face to face discussion in the classroom (Scrimshaw 2001).

2.3.4.4 Motivation and learning

The above learning theories have all been used to support motivation in learning (Wishart & Blease 1999). Cox in reviewing the research literature found the following claims had been made of the positive effects of IT on students' motivation;

- Increase in commitment to learning tasks
- Enhanced enjoyment and interest in learning
- Enhanced sense of achievement in learning
- Increase in self-directed learning and interdependence
- Enhanced self esteem leading to expectations of achieving long term goals.

(Cox 1997).

Much of the research on motivation and information technology has been based on specific IT projects. Cox in her own research on motivation and IT in normal school environments, across a range of subjects, found that for the majority of pupils there was evidence to support the above claims. However she also remarked that the actual frequency of IT use by pupils was lower than might be expected (Cox 1997).

HMI inspections in Scotland reported high levels of motivation were almost always apparent where pupils were using ICT well (HMI 2000). This they stated was conducive to raising pupils' attainment in coursework. They commented on the fact that many schools had not considered sufficiently the impact on attainment and that effective practice was not yet sufficiently widespread (HMI 2000).

Research on the effect of installing a computer network in a secondary school reported increased enjoyment in learning as well as improved teaching and learning (Wishart & Blease 1999). The research was carried out in the first year of the network and the authors identified that further research on long term use should be done. It would seem then that there is still a need for research which looks at motivation and ICT both after long term use and where ICT is available in every area of the school.

2.3.5 Factors affecting the development of ICT

The key factors identified in the literature as affecting the development of ICT in education will now be discussed.

2.3.5.1 Hardware

Both the Stevenson report (1997) and the McKinsey report (1997) highlighted problems with the age of ICT equipment. To overcome this, government funding for hardware and software was made available and partnerships with private industry developed. This “match-money” had to be bid for and meant that the school or the authority had to find other money through its own funds or through sponsorship (Small 1999). In Scotland £62 million was allocated to education authorities via the Excellence Fund over the three years from 1998. Some authorities appeared to have invested additional funds with overall education authority investment to central government investment 40:60 (SEED 2001). In addition certain criteria had to be met to receive this funding. An early study of NGfL implementation found that the running and ongoing costs (mainly telecommunication charges) were unacceptable for most schools (Smith & Wishart 2000). Although schools were mostly satisfied with the results of installation, school budgets did not allow for any additional costs.

A report on ICT found that 92% of secondary school teachers gave insufficient numbers of computers in the classroom and 87% lack of access as obstacles to integrating ICT (SEED 2000). As the NGfL has developed and the number of computers in schools increased, there is evidence that problems of access, once a main concern of teachers is no longer such an issue (Williams 2000).

One of the keys to the success of the collaboration theory is how computers are organised in the classroom. Separate computer rooms have been seen as dislocating to the way children view computers in the learning process as they might suggest that computers are special (Chandler 1992). Crook advocated “clusters” of computers within a classroom (Crook 1994).

2.3.5.2 Software

One of the criticisms levelled at previous initiatives on IT in education was that the funding concentrated on the hardware and not on the software, which has greater relevance for curriculum applications. An example of this was the introduction by the government of CD ROMs into primary schools before suitable software was available (Russell 1995). The

Libraries of the Future project highlighted problems for pupils in finding relevant and suitable material for the curriculum on the Internet (NCET 1996). This caused frustration especially with the nature of the Internet and sources moving or disappearing altogether.

The Stevenson report (1997) highlighted the lack of software in UK schools and suggested that the government should find a way of sharing teacher material and creating a market for the UK software industry. The government has shown a commitment to providing quality content through the Virtual Teachers Centre (VTC) on the NGfL. Will this be sufficient for schools needs? The VTC was expected to act as a stimulus for “the development of appropriate content for the Grid by teachers themselves” (DfEE 1997b, p.17). Scotland and Wales also got a Virtual Teacher Centre to meet their local needs. These VTCs linked to a range of other sites of educational value. However in a Scottish report on ICT initiatives only 3-4% of primary and secondary teachers surveyed identified the VTC as a form of support (SEED 2000).

2.3.5.3 Training

Criticism of previous IT training has been levelled at the form of training given and the focus on technology as opposed to curricular use (Russell 1995). The McKinsey report (1997) indicated a problem with teachers and their readiness to use ICT. This was also identified in the Stevenson report (1997) and a Scottish report carried out by Robert Gordon University (RGU 1998). To overcome this £23 million of Lottery money has been provided through the New Opportunities Fund (NOF) for the training of teachers and librarians in Scotland. Training is not only in basic IT skills but in the use and application of new technologies to subject teaching. This is vital as it had been highlighted that access to technology alone does not mean that it will automatically be introduced into teaching and learning (RGU 1998).

All schools have been allocated money for training. Training started in Spring 2000 and was due to be completed by 2002. Progress with training in Scotland has been slow (SEED 2001). Attending courses on various technologies (eg Internet searching, CD ROMs, presentation software) and then having the confidence to teach with these in the classrooms will be quite different. In the High Tech Schools projects in the USA there was heavy training before the schools were filled with technology (Van Horn 1994). They recommended 80-120 hours of classroom instruction. The UK training programme was based on training once the machines and software were there. The New Opportunities

Funding have not provided the level of training that these American technology project schools had.

The infrastructure, the content and the training are the “essential and equally important components (*that*) underpin the NGfL concept” (SEED 2001, intro). There are a number of other factors which could be significant in ICT development in schools.

2.3.5.4 Senior management and other support partners

The EDSI projects cited amongst factors leading to success the quality of senior management and of other project partners (DfEE 1997b).

2.3.5.5 Development plans

The report into ICT in Scottish schools found that where the project was integrated into the school’s development plans it had greater effect (HMI 1998). A criteria for NGfL funding was that education authorities have to prepare ICT development plans (BECTa 1998). Schools also must have an ICT development plan. Although these might focus on ICT and networking, they may not be ready to focus on the intranet yet.

2.3.5.6 Motivation

The EDSI report stated that the schools and colleges involved were not untypical of national schools and colleges although they perhaps would have a higher level of motivation (DfEE 1997b). Schools had to show a commitment to take part. Staff interest and enthusiasm would be expected to affect the speed of network development. EDSI reported that

“a school or college needs to have reached a certain level of readiness before it is beneficial to introduce ICT, and many schools or colleges (or even most) are probably not yet at that point. Any strategy for national development will have to recognise this, and take account of the different philosophies and aspirations among schools and colleges.”
(DfEE 1997b, p.31).

Not all schools will be ready at the same time. Within a school the stance towards ICT and the educational and social philosophies could be important.

2.3.5.7 Technology support

The Libraries of the Future highlighted a range of practical problems that schools faced

- Lack of robustness of technology
- Time in identifying faults
- Need for training of staff to deal with technical issues
- Security/ethical issues

(Bergen 1997).

Although technology support was clearly mentioned in the EDSI projects the importance was understated with an assumption that many of the problems came from the technology itself and could be resolved with quality infrastructure and hardware.

2.3.5.8 Time

The interim report on ICT initiatives undertaken in 1999-2000 found that 100% of teachers in secondary schools surveyed reported time as the main obstacle to ICT development (SEED 2000). For staff there were too many priorities competing for their attention.

2.3.6 Conclusion to the development of ICT in schools

The learning theories provide some justification for the inclusion of ICT into learning and teaching. It appears that “whatever educational philosophy one espouses, IT opens up new possibilities for supporting it” (McKinsey 1997, p.4). Throughout the reports from the Scottish Office and the NGfL there is much evidence to suggest that teachers are being told that ICT should only be used where it is of benefit to learning and teaching. An intranet available throughout the school may enable teachers to use ICT as appropriate in their classwork.

2.4 The School Library Resource Centre and the school librarian

Scotland has a high proportion of chartered librarians in its secondary schools (LA & SHU 2000). However it is not a statutory requirement to have a school librarian or School Library Service despite recent efforts in the Scottish Parliament (SLA 2000). Since the re-organisation of local government in 1996 some of the School Library Service support has been provided through the Education Service whilst others have been taken over by the Public Library Service.

Although the HMI have always included the SLRC as part of the inspection process, more direction was given from August 2000 (SLAINTE 2001). The HMI can now refer to the performance indicators which are part of *Taking a closer look at the SLRC* (SCCC 1999). These along with the *Standards for School Library Resource Services in Scotland* (COSLA 1999) and the Library Association *Guidelines for Secondary School Libraries* (Tilke 1998a) provide a framework for the role of the school librarian.

Most school librarians work on their own within the SLRC. There are exceptions. Community schools, split site schools and some private schools may also have a library assistant. School librarians are responsible for all the work within the SLRC from management to clerical. Some school librarians are aided by parent helpers, or have support from school administrative staff.

2.4.1 Function of the SLRC

The SLRC provides a resource collection to support the whole school. The provision of resources alone is not enough to describe the function of the School Library Resource Centre (LISC 1984). This report of the Working Party on School Library Services brought to the fore discussion on “learning how to learn” and the library as a “learning laboratory.” The function is no longer simply to provide the resources but to supply an environment where pupils can develop the capabilities to use resources effectively. The UK government has developed policies on lifelong-learning skills and the SLRC is central to these policies. The last decade of the 20th century saw the introduction of the Internet and the start of networking in schools. One of the necessary requirements as listed by COSLA for a School Library is that it should be

“appropriately resourced, with a range of material supporting the school's curriculum, and equipped as a learning and teaching centre for ICT”
(COSLA 1999, 1.12, p.11).

The 1999 Library Association survey of UK School Libraries found that Scotland was leading the way with 92.4% of secondary schools surveyed describing their libraries as multimedia centres (LA & SHU 2000). This was reflected in the high number of non-book materials available compared to the rest of the UK. Although almost all schools will have some ICT equipment in the SLRC, it is expected that the extent of this will depend on space and priorities of individual schools and authorities.

The most recent change to the function of the SLRC is the possibility of electronic delivery of information resources to the classroom. Will every classroom with access to the network become a similar "learning laboratory"?

An important function of the SLRC has always been that it

"provides opportunities for the individual to read more widely and think more deeply"
(Tilke 1998a, p.12).

The SLRC should meet the leisure and recreational needs of its school community.

2.4.2 The role of the school librarian

In reviewing the literature on school librarianship it is evident that the question of changing role is one which continuously resurfaces.

"...in the light of significant changes in the teaching methods and teaching resources of the secondary school, it was felt that the role of the librarian invited re-examination, as did the precise nature of the relationship between teacher and librarian"
(SED 1976, 1:4, p.1).

Research in school librarianship in the UK has been carried out to investigate the role of the school librarian in general (SED 1976; LISC reports 1984,1985), within specific changes to the school curriculum (De Silva 1989; Heeks & Kinnell 1994; Kinnell 1994), in relation to changes in the educational process (Lincoln 1987; Streatfield & Markless 1994; Thomson & Meek 1985; Valentine & Nelson 1988) and in a combination of change to both curriculum and educational process (Howard & Hopkins 1988; Howard 1991). There has also been a number of reviews of research literature related to school libraries (Pain 1987; Heeks 1989).

What is clear from the evidence of these UK reports is that schools should have the services of a professionally qualified school librarian and that the librarian has a role in resourcing for

the curriculum and in supporting learning through development of an information skills programme. Throughout a number of these reports it is evident that there is the need for "collaboration" between school librarians and teachers if either role is to be met (Lincoln 1987; Howard & Hopkins 1988; Kinnell & Pain-Lewis 1988; De Silva 1989; Streatfield & Markless 1994).

As yet there has been no assessment of the librarian's role in the UK within new technology although this has been considered as a factor in a number of the research reports (Valentine & Nelson 1988; Kinnell 1994; Streatfield & Markless 1994). Valentine and Nelson found that the presence of new technology was not a central factor in the role of the school librarian as in several cases it lay unused (Valentine & Nelson 1988). This research was undertaken at a time when there was no great use of technology within schools. Later research found an increasing "technological" role for school librarians and remarked on the consequent need for better training (Streatfield & Markless 1994). The action research projects found a close relationship between delivering resources, information skills teaching and IT awareness (Kinnell 1994). These were case studies of good practice with supportive senior management and may not be representative.

Evidence is lacking regarding school librarians' involvement with ICT in Scottish schools. The RGU report identified that one third of the Scottish teachers who took part in the survey kept up-to-date with ICT developments through their school librarians (RGU 1998). This suggests that many school librarians are using ICT and may be leading the way in schools. The COSLA standards makes a number of references to the school librarians' involvement in using ICT in their information skills programmes. This includes searching techniques on the Internet and CD ROM. On the policy side they advocate a role for the librarian in developing good practice guidelines and acceptable use policies. Additionally schools "should consider the role of the SLRC in the context of network management" with other staff in the school (COSLA 1999, 3.28, p.29). However this role is vague and the extent of involvement in areas such as web site development and maintenance, and technology support is not mentioned.

There is one significant difference that has to be considered in comparing school librarians in the UK with those elsewhere. The International Association of School Librarianship advocate that "school librarians be qualified teachers who have, in addition, completed

professional studies in librarianship" (quoted in Brown & Shepherd 1999, p.79). Australian school librarians tend to be teacher qualified as are most US and Canadian school librarians.

The Bullock report on school librarianship recommended dual qualification in the UK (DES 1975). Later research stated that this was not a viable option and suggested advanced courses of study for practising school librarians (LISC 1985). Pain (1987) reiterated this with the argument that advanced qualifications enhance status and the study of education gives school librarians a broader perspective which could lead to improvements in working with teachers. Studies in the UK have found that qualified school librarians do not feel the need for a full teaching qualification (Valentine & Nelson 1988: Herring cited in Hay, Henry & Oberg 1999). Compared to the rest of the world, the UK stands alone on dual qualification.

2.4.2.1 Resource provision - The information management role

Most librarians are quite clear that a primary role is to provide information and recreational resources for the school, in a variety of formats. This role encompasses acquisition of stock, (budget management), cataloguing, maintenance and the lending of stock. Most of this will be undertaken using library administration packages.

Each change to the curriculum requires a change in the resource provision. The COSLA standards advocate that

“Early consultation between the SLRC and subject departments is vital if resources are to be available in time for the implementation of curriculum changes”
(COSLA 1999, 3.3, p.23).

There has been little recent research on the subject of resourcing. Previous research in the 1980s found that departments had a tendency to build their own collections (eg De Silva 1989; Valentine & Nelson 1988). Changes to the resourcing role, when the intranet acts as a vehicle for curricular support, has not been discussed in any great detail in the professional literature. It is argued that the 21st century school library should be more about connections than collections (Todd 2001).

2.4.2.1.1 The centralised library catalogue

One of the recommendations from De Silva’s research (1989) was for senior management to consider a central catalogue for all learning resources. As far back as 1976 this was a recommendation in the Stimpson report (SED 1976). The *Library Association Guidelines*

argue for central coordination of all school learning resources and suggests that departmental libraries should be discouraged (Tilke 1998a). COSLA advocates a school audit of departmental and library resources and that there be a clear rationale for the funding, location and use of curricular resources (COSLA 1999). Yet in a small survey of teachers and librarians in two Scottish authorities it was found that fewer than one third of respondents ranked a central catalogue of learning materials in a school as important in rating a good School Library Service (McLelland 1996).

De Silva in making the recommendations to senior management pointed to the necessity for a whole school perspective on provision of resources (De Silva 1989). The Libraries of the Future project which looked at the introduction of information technology resources in schools, noted that it helped if the senior management saw the library as a whole school issue (NCET 1996). The librarian has a role with the school management team in "managing resources across the school" (COSLA 1999, 3.6, p.24). It may be that as more schools invest in OPACs (Online Public Access Catalogue) involving financial support from senior management, more consideration will be given to utilising these to their full extent.

2.4.2.1.2 Quality resources

Many school librarians have been encouraged by the changes to the curriculum to maintain a collection of varied resource material. Stonelaw High School in Glasgow is likely to be typical in its collection of pictures, news cuttings, handouts and booklets on topical issues such as vivisection and solvent abuse (cited in Pain 1987). Scottish SLRCs are not alone in this. Woolls in her volume for the American media specialist argues the necessity of maintaining a "vertical file" despite writing at a time of Internet access (Woolls 1999). Even with the growth of online access SLRC collections will continue to include both print and electronic resources as there will still be a necessity for local materials (Donham 1998). Will the intranet now become a focus for such collections?

There is no doubt that the Internet can provide a vast quantity of resources which school libraries have previously been unable to obtain, but it also raises the need for quality and evaluation. Within resource management librarians have a clear role in evaluation of resources. Technology simply means an extension of this role to include the Internet and CD ROMs. Identifying websites suitable to support the curriculum (COSLA 1999) has been described as "performing a traditional collection development function within a new environment" (Dow 1999, p.129).

It has been argued that librarians have a "key role to play in putting the Internet into a context for staff and students" (Kinch 1999, p.210) and of advising of the most appropriate source to use. It is clear from the many papers on school librarianship that open access to the Internet is not the way forward and that a network with evaluated resources is preferred. McKenzie states

"a network can only support the curriculum if it is "equipped" with information which is well organised and useful to those exploring problems and making decisions"

(McKenzie 1998, viewed online).

Schools require access to information which is "useful." McKenzie (1998) an American educational consultant suggested a need for the librarian to consider what are described as "information rich sources" such as the online subscriptions to Electric Library, SIRS, or EBSCO. Woolls (1999) also suggested Newsbank and UMI. Cost will be a major factor. Evidence of online subscription use is difficult to find in UK secondary schools. Individual schools are known to use such services as Reuters Advertising and Media Briefing (Jones 1996) but it is not known just how widespread subscription use is. Bowles pointed out that use of electronic information sources has been around in the tertiary sector for a number of years in Australia, but it is only recently that a growing number of these services have been marketed at schools (Bowles 2000).

The second point made by Mackenzie is with regard to the organisation of the resources. Students and teachers need to know what is available and where to access that information. And librarians as information managers should have an input into the organisation of networked information systems.

2.4.2.1.3 Current awareness

School librarians are expected to inform staff of new resources relevant to their subject area and are encouraged to "maintain a file of individual teachers' specific interests and requirements" (Tilke 1998a, p.49). Through their access to publishers' catalogues, school librarians will be aware of new materials for all subject areas and of all formats. Some may even scan resources to provide selective dissemination of information for staff (Herring 1988). Librarians may include quality web based resources in the current awareness information they pass onto staff (Macdonald 1997). Traditionally this could be done by

newsletters, information sheets or in person. Email could now speed up this process. The Scottish Virtual Teacher's Centre is expected to be a focus of current awareness.

School librarians may also be responsible for a staff professional collection (Tilke 1998a) and be expected to inform teachers of new staff development materials and educational reports. The librarian may have a role in extending staff collections through the use of AskERIC (American Internet-based information service for educationalists) and educational discussion lists on the Internet to support teachers (Dow 1998).

2.4.2.1.4 Careers materials

Depending on the school, librarians may be responsible for the organisation and maintenance of careers information (Tilke 1998a; COSLA 1999). PLANIT and PROGRESS are key online career resources produced in Scotland. As with the information resources above, school librarians may be expected to "help" students in their use of the careers library. There is very little written on the school librarian's role in careers information in the UK whilst no mention was found in the standard international texts on school librarianship (eg Woolls, 1997; Yesner & Jay 1998).

With the exception of careers information the expectation of writers in school librarianship is that the role of the school librarian in the UK within resourcing does not differ greatly to the international literature on school librarianship.

2.4.2.2 Learning, the instructional role

Early evidence from a Scottish study on the impact of a good School Library Resource Centre on learning indicated that schools "lack the understanding of the relationship between the resource centre and learning" and hence it is difficult for schools to evaluate the impact of resource centres on learning (Williams & Wavell 2000). This study looked at learning in its broadest sense. It highlighted a problem for Scottish school librarians in that their work is often seen as "external" to the learning and teaching in the classroom. The performance indicators provide some guidance with "Quality of pupils' learning" as one of 13 indicators in measuring performance of a SLRC (SCCC 1999). School librarians are expected to ensure outcomes, tasks activities and resources match the needs and aptitudes of pupils (SCCC 1999).

The results of the Colorado study on the impact of the school library on academic achievement has been promoted world wide by librarians as a significant indicator of the importance of the role of the school librarian. In 1999 the study was repeated in three states; Alaska, Pennsylvania and Colorado. From this there was one consistent finding

"A school library media program with a full-time media specialist, support staff, and a strong computer network (one that connects the library's resources to classrooms and labs) leads to higher student achievement, regardless of social and economic factors in a community"

(Hamilton-Pennell et al 2000, viewed online).

A key to the second Colorado study was the collaborative approach of library media specialists and teachers to information literacy (Lance, Rodney & Hamilton-Pennell 2000). Information Power has focussed on information literacy and the need for collaboration and leadership from the school media specialist (AASL & AECT 1998). This has become one of the major themes in the American literature on school librarianship.

The Australian literature follows similar themes to that of the USA. In Australia there is much reference to "collaborative planning and teaching programs" (CPT) which are differentiated from "resource based inquiry" (RBI) work by the fact that the latter can occur without direct involvement from the librarian. In CPT the teacher librarian must work in collaboration with the teacher but concentrate on information literacy and the process of learning. Henri, one of its strongest advocates, lays great emphasis on the theoretical underpinnings and hence on the need for a teacher qualification to understand these (Henri 1996). Kuhlthau states that "the library is the inquiry centre in the information school age" (Kuhlthau 2001). The basics of constructivist theory have given school library programs the theoretical foundation for adapting to meet the needs of this information school age (Kuhlthau 2001). Therefore it seems logical that school librarians know and understand the principals of constructivist theories. Kuhlthau refers to the librarian as "an essential agent" in the learning process (Kuhlthau 2001).

Henri emphasises the teacher librarian as a charismatic figure, leading the movement and influential in change (Henri 1996). Woolls advocates that after years of undertaking a "helping role, " librarians are now in a position to take on a "leading role" in curriculum reform (Woolls 1999). This is a logical progression, partly due to their unique position in that they see all students, teachers and have knowledge of the whole curriculum (Woolls 1997).

This idea of school librarians leading change has come under attack for being an unrealistic target for the majority of teacher librarians, even in countries where they are dual qualified (Mobley 1994). Pickard reported that only 10% of school library media specialists actually carried out the role of instructional leader - involved in joint planning, teaching and evaluating (Pickard cited in Asselin 1999). The reasons given are that they often lack status whilst the reality of school politics means that this leadership role is difficult to achieve (Mobley 1994). Mobley advocates the view of the teacher librarian as “instructional consultant”, involved in the planning stage of the curriculum but not necessarily involved in the teaching, assessment and evaluating stages (Mobley 1994). If they are included in the planning stage then this should not only lead to effective resourcing, but ensure the integration of information skills.

No research in Scotland accurately states how many school librarians are involved at the different stages of planning, teaching and evaluating the curriculum. The information from the Library Association survey can give a rough guide in that most school librarians identified that they worked with some subject departments but only 7% of those surveyed attended curriculum development meetings most of the time (LA & SHU 2000). A “consulting role” is one which is more likely to be nearer to the reality of what happens in Scotland’s schools. Change in teaching methods which evolved with the changes to the curriculum and which were described in the earlier chapter are affecting use of the SLRC.

“The Task Group’s visits revealed that the role of the SLRC in supporting the curriculum continues to grow, as a result of changes in curriculum design and in approaches to learning and teaching”
(COSLA 1999, 3.2, p.22).

In addition to the effect on resources, librarians have found themselves in more direct contact with pupils. This may involve "classwork where appropriate" (SCCC 1999, p.40) or discussion on the organisation of resources or aspects of finding and using resources.

2.4.2.2.1 Information skills consultant

In the late 1990s the term information literacy has become prevalent in the literature of school librarianship. It covers the traditional term “information skills” incorporating the correct use of information sources but also includes the use of critical thinking and problem solving skills.

The increased interest in information literacy is explained by

- Increasing information in various forms
- Information technology and issues related to new forms of communication
- Consequence of 1 and 2. The changing educational methodology that is needed to respond to these societal changes

(Hannesdotir 1999).

As discussed the Scottish curriculum has addressed the issue of what are termed “core skills” and “learning and study skills” through the Higher Still curriculum. These skills are important for developing independent learners. So important does the Scottish education system now see these skills that information on pupil attainment of core skills is included in the new exam certificate in addition to the traditional qualification attained (SOED 1994). School librarians may develop skills courses for pupils to incorporate information skills relevant to using technology.

A recent review of information literacy reveals that there has been a great deal of international research on the subject (Loertscher & Woolls 2002). A number of the research reports reviewed included use of OPACs, use of the Internet, CD ROM and use of search engines by school children. It was reported that researchers were concerned about the sophistication of student research techniques and about their ability to sort through large amounts of information to get to the best resources (Loertscher & Woolls 2002). Specific reports cited in Loertscher & Woolls (2002) found that students were often uncritical of content (authority and quality) on the Internet (Kafai & Bates: Hirsch), were reluctant to write annotations for Internet sites (Kafai & Bates) and would copy entire sections of text from CD ROM (Large, Beheshti & Breuleux).

Todd in reviewing research papers on students using the World Wide Web (mainly American) dispelled the myth of young people as gurus in this digital world (Todd 2001). He highlighted the learning dilemmas pupils face making reference to work which he had previously published on learning dilemmas (Todd 2001).

These "learning dilemmas" include

- Appropriate design tasks,
- The ability to understand search engines,
- The ability to use appropriate search skills (eg keywords, broaden, narrow search, Boolean logic)
- The ability to judge the quality of information once found and to use it to construct an answer which displays understanding of the question.

(Todd 1998).

Educating users in search strategies is a role for school librarians involved with technology (Debowski 1999). The basics of these are key information skills many of which librarians have been concerned with for years. There is a range of information literacy models which have been developed to support pupils with their learning (see Loertscher & Woolls 2002). Some of these have been evaluated and there is evidence that students find these structured approaches of benefit (eg Herring 2000a). Another approach to supporting information literacy would be to modify systems to make it easier for students to find the information they need, to bookmark appropriate Internet sites, add subject headings to the catalogue, cross reference, supply quick search guides and databases of FAQs (Loertscher & Woolls 2002). A number of these suggestions could be utilised on an intranet.

What was clear from looking at the documents on Scottish education is that there is now more interest in information skills within the school curriculum. COSLA advocates a whole school approach to information skills and an audit of information skills taught by each department (COSLA 1999). Where there is a whole school commitment to information skills there is less need for the librarian to act as a whole class instructor but to take on a role of "incidental and individualised guidance" (Debowski 1997, p.30).

2.4.2.2.2. Teaching the use of the technology

The NOF training in ICT offered to school librarians encouraged them to work with teachers to help develop pupils' information skills and ICT use. One of the findings from the survey of secondary school library users was that pupils and staff required more instruction on complex use of IT resources (particularly CD ROM and OPAC) (Spreadbury & Spiller 1999). It is known that librarians instruct students in word processing and encourage creation of reports on the computer (Woolls 1999). There is evidence that in some UK schools teachers are unhappy about librarians encroaching on "teaching" of ICT skills to pupils

(Hyams 2001). School librarians are being asked to take on "much more directly pedagogic roles" (Hyams 2001, p.100) which raises issues of pay and status.

It is also likely that some librarians will demonstrate how to use different forms of technology to staff. It has been suggested that "library media specialists who stay at the forefront of technology in their schools can readily offer in-service teacher training" (Donham 1998, p.180). In the UK it has been stated that "providing training may be an irregular activity for a school librarian" (Tilke 1998b, p.126). Tilke encouraged this participation as an opportunity for school librarians to integrate the library into the life of the school. School librarians have been described as being at the forefront of ICT use and this gives them the chance to provide professional development to teachers "on a significant and continuous basis" (Pappas 1997, p.33). In-school training of teachers by school librarians has been reported in a positive light as it can be done in a "practical and non-threatening environment" to teachers new to ICT (Lucas 1997).

2.4.2.3 The technologist roles

New technology is seen as improving the image of school librarians and profile of the library (Valentine & Nelson 1988; Kinnell 1994; Waters 1994). School librarians are motivated to become involved in new technology developments (Cox-Townend 2000).

2.4.2.3.1 Network Manager

The organisation of information and access to information as discussed under resourcing is clearly a role related to the librarian as information manager within the confines of the SLRC. Herring puts forward the case for librarians to take on the role of information manager to "direct the overall use of IT resources in schools, including networking, school administration and use of IT learning resources" (Herring 1994, p.155). Similarly in the Australian literature there is the suggestion that the library becomes "the information services unit" which would include all school technical support services and personnel run by a "director of information services" (Lee 1996, p.7). This appeared to happen in at least one school where the librarian was appointed as Information Resources Manager with responsibility for the network, information resources, staff professional development and for creating a learning environment suited to new technology (Wake 1999a). There may be conflict between library, technical support and computing departments unless the library is clear about its specialist role as an information service (Debowski 1997). This is a move away from stand alone library services and computer laboratories to a hub for all information

services support for the whole school community. This would require a whole school approach. There is no evidence of this occurring in Scottish schools.

School librarians are encouraged to work with technical support people to ensure best content organisation and best method of delivery on the school network (Ryan 2000). Librarians are warned of the danger of being sidelined if they are not involved in the management of information and communications technology (eg Morrill 1995; Jones 1996). A criticism has been that they have failed to place themselves "strategically" within schools (Debowski 1997) and to make their role clear to staff. It is important for librarians to become part of the strategic planning processes in schools (Kinnell 1994).

The increase in new technologies, including the intranet has repercussions for copyright. In addition to skills of resource management, librarians will often have some training and knowledge of copyright issues and could have a role to play in the development of access policies and acceptable use agreements (Simpson 1998).

2.4.2.3.2 Technical and software support

A large number of machines to be managed in the SLRC may require more collaboration with IT staff, computer service providers and technical staff (Mallin, Lundin & Burns 2001; Jones 1996). Or will school librarians simply be forced to take on the role of technical support? At the Ernest Bevin school less time was spent on traditional library tasks as more of the day was given to IT support (Chandler 1994). The bonus of this was the improved status of the library and librarian. It is known that some school librarians have taken on more technology related tasks, including maintaining the equipment, and network password administration (Todd 2001). There has been mention of library media specialists installing firewalls and filters (Woolls 1999). Do newly qualified school librarians have this kind of training? A major concern must be the time commitment (Woolls 1999). Others suggest that this is the role of a network specialist or technician and not an educator (Donham 1998). The reality of Scottish education is that few schools can afford a full-time technician let alone a network specialist. The co-ordinator's role is very likely to be that of a teacher. Issues of skills, power, status and pay are likely to be relevant to any Scottish school librarians looking at taking on this role. Perhaps of significance is the fact that Scottish head teachers do not regard school librarians as IT leaders (Herring, cited in Hay, Henri & Oberg 1999). This was in contrast to what was reported in surveys carried out elsewhere in the world (Hay, Henri & Oberg 1999).

2.4.2.3.3 Web page creator

Writers on school librarianship give a high priority to the development of library homepages eg "The school's network needs to see a visible library service" (Debowski 1997, p.31). There are few examples of Scottish school library homepages on the Internet. In the UK there is only a limited number of quality school library sites. Specific skills required are authoring skills and design skills whilst using a scanner may be important if converting paper based documents or photographs to a digital format (Scully 1996).

2.4.2.4 Literacy support

School librarians are expected to work with teachers to support the development of literacy and reading skills in secondary schools (COSLA 1999, 3.15-3.16). This could involve working with others to identify resources, promote reading activities or develop reading schemes (COSLA 1999). With the growth of technology the importance of literacy has not been lessened as it has been shown that lack of literacy skills can hamper information technology use (Carter & Monaco 1986). It is not uncommon to find such statements in the literature: "In an age when technology is making significant strides in education reading has become more important than before" (Prostano & Prostano 1999, p.75).

2.4.2.5 Supervision

In addition to normal school class use, pupils may use the SLRC for independent study, during free time, at intervals and possibly before and after school (Drury & Dubber 2001). Librarians are responsible for the supervision of school students in the SLRC. There is little information regarding how the management and supervision of ICT access has affected the role of school librarians.

Schools have been encouraged to develop Homework Clubs or Supported Study groups and this may involve school librarians (COSLA 1999). This may require access to the SLRC (and to computers), and supervision by staff (librarian or teachers). The role of the librarian is also recognised in offering assistance in using the resources.

2.4.2.6 Promotional role

Throughout the literature there is much discussion on ways in which librarians should promote (Tilke 1998a), market (Woolls 1999) or act as advocates (Donham 1998). "Marketing" is viewed as an essential investment for the library media manager (Woolls

1999). Promotion could be through newsletters, involvement in whole school activities, author visits, book events, displays and professional development with staff (examples from Doiron 1999; SCCC 1999). Librarians to varying degrees will carry out some of these activities.

2.4.2.7 Factors affecting the role of the school librarian

There are a number of factors which have been identified in the research reports as critical to the role of the school librarian.

- Senior management support for the school library (Howard 1991; Heeks & Kinnell 1994; Henri, Hay & Oberg 2002).
- Status of school librarian (Howard 1991). It has been pointed out that despite recommendations for head of department status this is not possible in the UK as most school librarians work alone (Herring 1988).
- Positive attitude by teachers (Streatfield & Markless 1994). This can be aided by presence in the staffroom (Heeks, & Kinnell 1994), informal liaison with staff (Heeks 1988) whilst in contrast it has also been shown that “isolation” can cause problems for the school librarian (Howard & Hopkins 1988).
- Teaching style of the school (Valentine & Nelson 1988). When the teaching style was formal and classroom based, use of the library was low and expectations of the librarian’s role narrower. In schools where more individualised learning occurred it was found that use of the library was higher and the librarians were actively involved in the teaching process.
- Presence on school committees such as curriculum co-ordinating committees or IT committees (Heeks & Kinnell 1994). This gave “a clear sense that the library was “owned” by the whole school and not just the preserve of some subject groupings” (Heeks & Kinnell 1994, p.65). Being on such committees promotes the value of the librarian to the whole school and is one of the Performance Indicators recommended by the SCCC (SCCC 1999).
- A library committee or working party. There is some debate on the value of library committees (LISC Scotland 1985) but reports recommend these as important to the work of the school librarian (Tilke 1998a).

Preliminary findings of Australian research indicate that the role of the librarian with new technology has been affected by lack of training, time and technical support (Cox-Townend 2000).

2.4.2.8 Education and training

Since 1980 all school librarians appointed in Scotland have been required to be degree qualified. Prior to this school librarians could be appointed who had taken the ALA accredited course through the Library Association.

Research in the 1980s had commented on the need for school librarians to have more in the way of learning theories and curriculum knowledge incorporated into their training (eg Valentine & Nelson 1988). There is little recent discussion on this in the literature, yet obviously it is a current expectation if school librarians are to support pupils in their learning. The question is whether the need for educational theories are as relevant now, or whether the necessity for technology skills to manage and maintain an intranet means that it is less important.

The COSLA group found evidence of concern about the quality of staff available for recruitment and problems of staff retention (COSLA 1999, 3.41, p.31). It recommended that Higher Education Institutes involved in library qualifications ensure all aspects of school librarianship receive adequate coverage (Recommendation 2.4).

An issue that emerged from the School Library Management project was the ambivalence of the “traditional” library skills (eg in-depth book knowledge) associated with resource management and “entrepreneurial flair” (eg advisory skills, promotional skills, ICT skills and the ability to write “inspection” reports) (Markless & Streatfield 2000). The latter are not new skills but as reported in the School Library Management project there does appear to be a change in the extent and depth of professional expertise required in such areas (Markless & Streatfield 2000). The LISU survey made the point that “approachability” should be a priority when recruiting school librarians (Spreadbury & Spiller 1999).

2.4.2.9 School Library Services

The role of the support services to school libraries will vary from authority to authority (COSLA 1999). The key parts of their remit which are relevant to this research are;

- Advice and support to school management, school librarians and educational directorate
- Policy development
- Professional development for school librarians
- Copyright (only in some cases)

(Adapted from COSLA 1999).

2.4.3 Conclusion on the SLRC and the role of the school librarian

As technology opens access to information, the skills of resource management and the teaching of information literacy should become even more important. It has been argued that the emphasis on information literacy with the need for the librarian to lead curriculum change has de-emphasized the librarians' role as information manager in much of the literature on school librarianship in the 1990s (Mobley 1994). The continuing development of ICT in the SLRC, by emphasizing information management skills, is to some extent redressing this imbalance.

Although there was a great deal of research in the UK on the role of the school librarian in the 1980s and early 1990s there is clearly a lack of recent research. There is now a need to reassess the role not only in relation to the use of technology, but within a networked school community. Although there is a great deal of international research on information literacy there is a need for research relating to information literacy within a networked environment.

2.5 Intranets

The term “intranet” is generally attributed to Amdahl who started to use it in 1994 (Jones 1998; Schultz,1996). It is however recognised that the technological concepts associated with the intranet were around before the term was first used (eg Fishenden 1997; McMurdo 1998). An intranet can be defined as “an organization’s internal communications system using Internet technology” (Blackmore 1997 p.23).

The first aspect to note is that an intranet is internal so private within an organization. The second is the use of Internet technology. The intranet should feel familiar to anyone who has used the Internet. There are two key applications of the Internet which are utilized in an intranet - email and the web browser. The web browser enables the user to “point and click” on icons to make links and move around documents. This enables users to “navigate” their way to the required information. Most recent definitions of an intranet include reference to the TCP/IP protocols, the Internet standards which allow for interactivity. However the term intranet has in the past been used to describe what Blackmore refers to as “flat content intranets” where you are limited to viewing the pages of the intranet (Blackmore 1997). For such an intranet to work, files are requested from a storage location or server, received by the desk top computer and viewed through the Web browser (Blackmore 1997). The Schools Online research projects investigated the use of the Internet in schools. Part of this research included an intranet project which involved building a local server in each participating school (DTI 1998). Initially these were all file-based systems, although that restriction loosened as some schools installed TCP/IP. Much of the content of the intranet came from “whacking” sites off the Internet, copied onto CD ROMs and sent to participating schools to give them a curriculum boost (DTI 1998). Other examples of web content expected on a minimal intranet would be newsletters, calendar of events, minutes and policy documents where there is no need to change or interact with the data (Blackmore 1997).

It is quite possible to upgrade to a fully interactive intranet with the use of an internal web server. Painsley School in England started developing their intranet in 1996 but moved in 1997 from a file based system to TCP/IP after upgrading their network (Challinor 1999). The TCP/IP protocol supports the use of software for email, video conferencing, online conferencing, support desks and such interactive services for the library as renewing of books or placing inter-library loan requests.

An intranet is non-proprietary ie not reliant on one manufacturer's computers or software. An intranet will work with what is often described as "legacy" systems hence reducing investment cost (Gralla 1996). It is possible to build an intranet with low cost servers and low cost, or even free browsers, keeping implementation costs to a minimum. However the SOEID recommends consideration of commercial products for their quality of support (SOEID 1998a). It is likely that intranet technology will still mean a substantial investment for schools.

Firewalls can be used to separate the Internet from the intranet. They may also be used to separate individual sections within an organisation. Within a company intranet, financial information or research and development sections may require a firewall (Cameron 1996). In a school the obvious target would be administrative data. For schools security is a major issue. Firewalls and filtering devices can stop pupils from accessing unsuitable information on the Internet and at the same time, enable safe display of pupils' work.

An intranet can be extended to include an extranet where it is opened to a group of "authorised" users. This has obvious implications for security and costs.

Organisations can provide an intranet through the services of a Managed Service Provider (MSP). You pay for the services you use, but in return the MSP will be responsible for maintaining, supporting and updating the underlying infrastructure. Health Services employ "Managed Services" (Harrison 1997b) and schools similarly are expected to use these (see eg Bostock 1998:DfEE 1997a; SOEID 1998a).

Information can be placed on the intranet by creating documents directly in HTML or through the use of a publisher such as Dreamweaver, FrontPage or Claris Home Page etc. Further enhancements can be made through the use of CGI techniques and Java.

2.5.1 Innovation and ICT diffusion

In order to understand intranet development it is necessary to put this in the context of technology implementation and beyond that innovation diffusion. Rogers' "Diffusion of innovations" first published in 1962 but now on its fifth edition, brings together diffusion research from many fields and identifies patterns of adoption and implementation which are useful to this research. Diffusion is "the process in which an innovation is communicated through certain channels over time among the members of a social system" (Rogers 2003,

p.5). Diffusion is a social process. One of the key concepts in discussion of innovation diffusion is that of critical mass. Critical mass is considered to have occurred early in the diffusion process when about 10% to 20% of the population have adopted the innovation (Valente 1995). Critical mass is the minimum number of participants needed to sustain a diffusion process. Once critical mass is achieved then diffusion of innovation is accelerated. Interactive media have required further explanation of the critical mass theory (Markus 1987) as there is an especial need for an early critical mass of users if an innovation is to appeal to other potential users.

Much of the literature on technology implementation has focussed on individual roles. It is obviously important to know who key individuals are and understand how they may aid the implementation process. Key role players in the diffusion of innovation have been identified as

- opinion leaders
- change agents
- change agent aides

(Rogers 2003).

Opinion leaders are likely to have an informal but influential position and be at the centre of interpersonal communication networks, whilst change agents communicate the innovation to organisational members and seek to influence their behaviour. Change agent aides assist change agents by having more member contact and by being in a position to influence innovation-decisions. In studying how an organisation keeps up-to-date with the state of the art in technologies it was found that there were a small number of key people to whom others frequently turned to for information (Allen 1977). These individuals act as “gatekeepers” and link the organisation to the technological world. The gatekeepers were likely to read more widely, to keep up-to-date with new advances in information, and have a great deal of personal contacts outside the organisation. New information fed back through personal contact with the gatekeepers to research workers and innovators within the organisation. An additional role specific to implementation of technology has also been identified as the technology champion, (Schön 1963). But these champions also called innovators (Rogers 2003) may work outside the organisational research team and without organisational support. The champion/innovators have similarities to the “gatekeepers” in that they also tend to travel, to read widely and to have a cosmopolitan orientation (Rogers 2003).

The past thirty years have seen great interest in providing models for use in the study of technology implementation in organisations. These generally are stage models where organisations progress through clearly identified, successive stages. With each further stage there is a new level of maturity in the use and management of technology within the organisation. One of the first models was Nolan's descriptive stage theory (Nolan 1973). Nolan correlated the growth of the computer budget to the changes in the planning, organizing and controlling activities associated with managing the computer resource.

- Stage I Initiation (slow annual increase in budget after computer acquisition)
- Stage II Contagion (highly increasing annual increases in budget with intense system development)
- Stage III Control (decreasing annual increases in budget with proliferation of controls) and
- Stage IV Integration (slow annual increases in budget with user/service orientation)

(Nolan 1973).

Nolan's model was subsequently modified (Gibson & Nolan 1974). This time the stages were described as initiation, expansion, formalization and maturity. At each stage they identified typical applications, personnel specialization, and management techniques. Associated with these stages was a distinctive, informal organisational process which in turn gave rise to issues to be resolved if the stage was to be passed without a crisis (Gibson & Nolan 1974). Nolan further modified the model to include two further stages, data administration and maturity, but retained his original conceptual descriptions of the first four stages (Nolan 1979). At that time it was suggested that no companies had yet entered the latter maturity stage. Each stage was this time described in terms of applications, data processing organisation, data processing planning and control and user awareness. What these models offered were benchmarks enabling managers to view where their organisations stood in the implementation process. There have been criticisms of Nolan's models in particular the use of the computer budget, the prescriptive management tasks he associated with the stages of the model, the evolutionist aspect where each stage is seen as a precursor of the next and the belief that integration will be achieved (see Damsgaard & Scheepers 2000). Despite criticisms, Nolan's stage model is still widely recognised and used by both practitioners and researchers (Damsgaard & Scheepers 2000).

Other models have been developed based on the same premise of identifiable growth phases in utilizing and managing information technology (see Galliers & Sutherland 1991). Many of these models focused on a particular stage of information technology or information systems planning maturity, rather than describing what is required to progress to more mature stages of growth. To address this Galliers and Sutherland propose their own broadly focused model incorporating strategic, organisational, human resource and management considerations. Key elements to identify each stage are identified using the seven “Ss” used by McKinsey & Company in their management consultancy (Pascale & Athos 1981). These are strategy (course of action leading to goals), structure (characterisation eg functional, decentralised), systems (procedural reports and routine processes), staff (description of important personnel categories), style (characterisation of how key managers behave, and cultural style of organisation), skills (of key personnel or firm as whole), and superordinate goals (shared values or culture of an organisation). This model has six stages of growth, each with a particular set of conditions associated with the Seven “Ss”. These stages are

- One “Ad hococracy”
 - Two Starting the foundations
 - Three Centralised dictatorship
 - Four Democratic dialectic and cooperation
 - Five Entrepreneurial opportunity
 - Six Integrated harmonious relationships
- (Galliers & Sutherland 1991)

As with other models the aim is to enable organisations to clarify their location in terms of information technology maturity and provide insights into information systems management and planning.

2.5.2 Intranets in organisations

The Internet enables people to share information around the world. The Internet has been described as a “sprawling, uncontrolled creation” still trying to establish its true identity (Vandome 1999, p.3). In contrast the intranet is a controlled, focused system that is very sure of its identity (Vandome 1999).

It has been said that technical definitions miss the point of what an intranet is all about. Intranets are about information democracy within an organisation, empowering individuals

with information so that they work more effectively (Mitsubishi 1997). The empowering of users is an important concept in this research when looking at roles in connection with the intranet. Users only click on the information they require. This has been described as a paradigm shift (Telleen 1995), a form of information pull as opposed to information push (Blackmore 1997). In the newspaper world the intranet has meant that journalists can now undertake more information searching on their own where they may previously have had to make requests through the library (Drennan 1999; Erbach & Iley 1999; Watson 1999). It is not just in the end use that there is change, but also in the information provision. An intranet is a distributed information system and therefore information provision need not be restricted to one department (Drennan 1999).

2.5.3 The development of intranets

It has been argued that the development, implementation and diffusion of intranet technology differs radically from that of traditional IT (Damsgaard & Scheepers 1999). This results from the key differences of intranets to traditional IT. These are that intranets have no specific function, time span, need not be developed by experts and are emergent in nature (Damsgaard & Scheepers 1999, p334). Many intranets in organisations have started as small projects before being taken up on a company wide basis and are not built from scratch (Gralla 1996).

Griffiths and Cameron discuss intranet development for organisations. Griffiths three stages of intranet development, in the form of generations is taken from Forrester Research (1996) and Cap Gemini (1999) (Griffiths 2000). The first two stages are identical to Cameron's summary of stages (1996).

Griffiths	Cameron
1. Information deposited. Users have to search.	Information distribution
2. Shared work sections, use of discussion groups, bulletin boards	Interactive stage
3. Intranet becomes part of the users normal activities and a valuable collaborative tool.	Extension of intranet to suppliers and customers

Table 1. Stages of intranet development in organisations.

Damsgaard and Scheepers (2000) in their research on intranet development in large Danish and South African organisations make use of Nolan's stage theory (1973) but avoid the controversial computer budget, the evolutionist aspect and do not assume that integration will be achieved. As with Galliers & Sutherland (1991), they make use of the seven S taxonomy of Pascale & Athos (1981) to structure the management and implementation aspects of their research. Damsgaard and Scheepers propose a progressive model based on Nolan's original stage descriptions where an existential crisis must be overcome in order for the intranet to survive and evolve to the next stage. If these objectives are not overcome then stagnation and regression occurs.

- Initiation: identify and recruit sponsor if intranet to evolve beyond experimental beginnings
- Contagion: achieve simultaneous critical mass of users and content for the intranet to self-expand
- Control: establish procedures and standardisation if intranet to stay up-to-date and useful
- Integration: seamless user access to the corporate memory across the organisation.

Of particular interest is the necessity for a critical mass of both users and content simultaneously, thus differentiating intranets from other interactive medium innovations.

The technical literature makes various suggestions on how to successfully implement your intranet (see Cameron 1996; Fishenden 1996; Morrell 1997; Van Cleve & Britton 1997 and others) which includes

- Assess content - existing paper files and documents
- Involve staff- the people who will use the system
- Need for staff training
- Need for senior backing- possibly a steering group
- Need for technical support.

These suggestions from the trade literature suggestions are now supported by evidence of factors required to support intranet implementation from research. There is now growing research on the factors in intranet development. Damsgaard and Scheepers (1999) adopted a taxonomy based on King et al's work (1994) on interventions of institutions in information technology innovation and diffusion in their own research on intranets. They found that all

six diffusion drivers were relevant but in the early stages of intranet development the critical drivers were

- Knowledge building (technical set-up, design, firewall etc)
- Subsidy (funding etc)
- Mobilisation (eg encouragement by workshops, seminars etc)

Whilst in the later stages the critical drivers were

- Knowledge deployment (training programmes)
- Subsidy
- Innovation directives (strategies)

(Damsgaard & Scheepers 1999).

In commenting on their research they stated that none of the organisations were exploiting all use modes of the technology at that time and that management support did not halt or change content and use of intranet technology.

Case study research of two corporate intranets also identified key factors in intranet development but organised these slightly differently.

- Sociocultural factors (user training, guidelines for use, knowledge sharing)
- Organisational factors (adequate structuring, archiving and continuous updating, determination of ownership, specification of roles and responsibilities) and
- Technological factors (appropriate design, bandwidth, user friendly tools and technology support).

(Breu, Ward & Murray 2000).

They considered that these factors should be addressed in a detailed business plan. What both research studies suggest is that there is a range of different contributing factors involved in intranet development.

Scheepers takes the research on intranets further by examining key role players in the initiation and implementation of intranet development (1999). These five role players were found to be

- Technology champion
- Organisational sponsor
- Intranet co-ordinator
- Intranet developer
- Content provider

The technology champion was the person who initiated the intranet. It was found that the role of sponsor was important to “nurture” the intranet development. As the sponsor gave political support and the co-ordinator took control, the role of champion diminished. The intranet developer was key for advanced applications whilst content providers were important for creating the critical mass of content which they identified as crucial to the development of intranets. What is significant in this research is that the senior management in organisations were not found to be crucial nor was there evidence of groups leading change. As in the research on innovation diffusion, there are individuals in a range of significant roles which have an important effect on intranet development.

2.5.4 The role of the librarian in intranets

Case studies of corporate libraries found that libraries often led the way in the deployment of intranet services (Hall & Jones 2000). With the onus on users to find information on an intranet this should have implications for the information professional. There appears to be a number of roles already identified within the literature for librarians - as managers of the content, as creators of the content and as trainers of the users.

2.5.4.1 Managers

Less time spent searching has placed more emphasis on the librarian as manager of information sources (Watson 1999). Roles for the librarian appear to be in organising the information pathways (Cawkwell 1996; Telleen 1995), and assisting the information flow to the end user (Marfleet & Kelly 1999). There also appears to be a need for librarians to influence decisions on the content of the intranet (St Clair 1998).

2.5.4.2 Content creators

The librarian's role at St Bartholomews and Royal London School of Dentistry has focussed on provision of web pages traditionally associated with library services (Besson 1998). However writers on newspaper intranets indicate that the intranet, as a vehicle for promoting information, has highlighted the need for creating more accurate and up-to-date information (Drennan 1999). This requires high upkeep in library staff time (Erbach & Iley 1999). Within these newspaper intranets there is emphasis on the librarians seeking out the type of information their users might want (being proactive). It is the kind of information which was formerly kept on a list pinned in the library office, but which now is being transformed into up-to-date information packs for the intranet. Here it is not the information itself which is new, but the distribution medium (Watson 1999). It is suggested that "proactive" librarians are now targeting internally generated information sources that appeal to the whole organisation, rather than the traditional provision of externally published resources, eg FAQ, company forms directory, Knowledge and Skills Directory (Hall & Jones 2000).

2.5.4.3 Trainers

Librarians have been involved in training journalists on the intranet (Drennan 1999; Erbach & Ilay 1999). Drennan views it as a logical extension of their role.

2.5.5 Intranets in schools

The first schools to set up intranets did so on their own initiative to meet needs within their own schools (eg Painsley, see Challinor 1999). Schools Online as a project involved schools which were already ICT motivated and keen to develop in that area (DTI 1998). With the NGfL, government and authority involvement there will now be many more schools developing intranets, not all driven internally. Schools Online stated that no two school intranets should be the same by the end of the project as the intranet should reflect the culture and needs of the school community (DTI 1998). This difference will be defined by how schools view the intranet and for what purpose they see it developing.

2.5.5.1 Why build a school intranet?

Intranets have the potential to

“.. bring new cost-efficiencies to schools and can also bring new opportunities for teaching, learning and managing educational systems.”
(Rutkowski 1996, viewed online).

Schools as learning communities should have a different focus to business organisations.

2.5.5.2 Cost savings

There is plenty of evidence to show that financial savings, and increased efficiency are also reasons for considering school intranets. These are generally associated with those in charge of education (eg government and authorities) rather than individual schools themselves. In the Schools Online Project the intranet was piloted as an alternative to the high online costs which came with regular access to the Internet (DTI 1998). Nottinghamshire County Council had electronic publication as their first phase of intranet development intending to make financial savings (Cole 1997). The education newsletter will go electronic and contacting schools by email should provide potential savings in postage. Schools themselves may also be keen on the low implementation costs as a way of making savings. Giralong Primary School in Australia piloted a simple intranet using limited computer resources advocating it as a way of optimising their school resources with a minimum budget (Long & Smith 1998).

As with the business world there is scepticism on how financial savings will work. For example will schools in Nottinghamshire now have to make an effort to obtain the information “shifting the effort from the local authorities to the schools?” (Cole 1997).

2.5.5.3 Community

Wake talks of the “sense of community” which an intranet can bring to a school (Wake 1999a). School events can be promoted on the intranet and all pupils participate. At Nathan Alexander Elementary school in the USA parents are encouraged to use the intranet to join discussions, review their children’s work and send email (Jacobson. 1997) thereby increasing parental involvement. To allow this parents can use Internet access from home, the library or community centre.

Gaffrey and Lee refer to the “co-operative atmosphere” which a network can create in a school (Gaffrey & Lee 2000, p.19). Stroth argues the case for a district wide intranet and the sense of community and improved communications which this can bring (Stroth 1998).

Sharing resources with the teacher next door may be as important as allowing pupils to share information with people around the world (Stroth 1998).

2.5.5.4 Teaching and Learning

Writers in education still feel that there needs to be strong educational justification for such major investment. It should be learning and information led, rather than technology led (Herring 1999). Pappas states

“Probably the most important challenge is that the needs of learners and the curriculum are paramount over the “glitz and the glitter” of technology” (Pappas 1997, p.34).

A constructivist approach to learning, with pupils actively involved in their learning would consider that the intranet has potential for adding educational value through the use of instructional websites, interactive lessons or video conferencing.

Clyde discusses teachers using the intranet for team teaching, and students working together on projects and activities across a range of age groups, buildings and subjects. This she claims can expose pupils to the kind of practices and styles of working which are more common in the corporate world (Clyde 1998). A number of schools use pupil teams to maintain and develop the intranet (eg Challinor 1999; Davitt 1997).

It should not be forgotten that schools already have a vast amount of resources which could be made available on the intranet or their presence at least directed to. It is reported that the network at Durham University led the staff in one department to incorporate material which was not previously in circulation such as lecture notes and students’ work showing different approaches on how to tackle a particular topic (Crook 1994). As BECTa states

“An intranet can be a route to a great deal of school information such as teachers’ work schemes, links to “off-line” resources and even tutorial modules” (BECTa 1998, p.21).

A teacher at Painsley writes that the hype of the Internet disguises the emergence of the intranet which he views as a much more potent tool for schools (Challinor 1999). Wake supports a school intranet over the development of Web pages on the Internet (Wake 1999a). It can be seen as more responsive to teacher and pupil needs as changes can be made quickly and easily without the official approval that might be required on Internet pages.

“Whacking” sections of the Internet onto the intranet enabled more pupils to benefit (DTI 1998). Blackmore talks of the intranet as a “Quality Filter” (Blackmore 1997) by guiding students through their own subject index on their “intranet resources pages” to relevant sites of educational value on the Internet. Whole sites can be targeted and copied on to the intranet (copyright permission required). By editing the URLs on each page users can be directed to the local intranet directory rather than its original location on the Internet.

There is also the possibility that students may be able to study a course which is not on offer at their particular school (Clyde 1998).

A skills programme on a college intranet to support level one students showed that not only could the intranet deliver content but it helped staff and students with the learning process (Hunter 1997).

2.5.5.5 School administration and school management

Computers are being used for a growing number of school administrative tasks. These could include: timetabling, records of attendance, class lists/pupil records, records of achievement, development plans, resources inventory, external examinations, staff development appraisal, personnel records and library automation and campus messaging systems (Crawford 1997).

Such administrative matters can be defined as “tasks associated with the day to day running in an organisation that ensure that the organisation performs smoothly and efficiently to its pre-determined goals” (Selwood & Drenoyianni 1997). Initially packages were bought for one particular task (eg to deal with finance) but in the 1990s schools moved to management information systems (MIS) which offer a range of administrative functions. The reasons for this are generally related to the Education Act 1988 (see Donnelly 1996: Selwood, & Drenoyianni 1997). This resulted in school management taking on responsibility for budgets, curriculum information, human resources, premises, property and learning resources (Selwood & Drenoyianni 1997). Schools require systems where information only needs to be entered once and can then be manipulated for different purposes, hence reducing error (see Pitts 1995).

The Scottish Office identified three packages SCETWORKS, PHOENIX and SEEMIS which are commonly used in Scottish schools and which support multi-user access as required with a network (SOEID 1998a).

In theory the school intranet can provide a platform for administrative functions. A secure network system allows a greater range of staff to access the required data from their own workstations. In studying the Superhighways Initiative a large section of this handbook was dedicated to school administration with one intranet model having administration as central. A case study of Linlithgow Academy's planned intranet found that the intended use was both administrative and curricular (Herring 1998).

The point at which schools move beyond simple administrative functions to using the information to aid management decisions (ie in analysing data to make decisions on strategies, tactics and goals) is a matter of some debate. Visscher's international research throughout the 1990s consistently found results indicating that MIS were being used for administrative functions rather than management (Visscher 1997). It is argued that the way school managers work, where they need to be quick and decisive, means that they like information they understand and think they can rely on and therefore have a preference for informal, verbal information (Visscher 1997). There is also UK evidence that despite widespread use of IT for administration, there is limited management usage (Selwood, & Drenoyianni 1997).

Careful consideration will have to be given if administration is to be part of the intranet and security concerns may be a reason given by schools for not putting such information on the intranet (Herring 1998).

A number of papers investigating use of computerised information and management systems referred to a model developed by Visscher (Dale & Habib 1991; Nolan, Ayres & McKinnon 1997; Visscher, Fung & Wild 1999). In this model the usage of the system is influenced by the system quality, the features of the implementation process and of school organisation. System quality is easy to assess when it is the same system that is being implemented throughout all the schools in the study. This is much harder to do with an intranet. The intranet could come as one package but equally it could be put together using previous systems. Nevertheless the model is useful, as are the identified variables in considering factors which have contributed towards the development (and failure) of these systems in schools.

Key variables are

- Training (received too little attention or too technical in nature (Visscher 1995); failure of training and support to meet user needs, especially for managerial staff, Visscher, Fung & Wild 1999)
- Clarification of user goals (Visscher, Fung & Wild 1999). The necessity that these are drawn up in cooperation with the users (Dale & Habib 1991). The New South Wales education department in developing a school administration system deliberately ensured that it was driven by end users rather than computer experts
- Management support with implementation strategy but not necessarily requiring ICT skills themselves (Dale & Habib 1991)
- An implementation strategy (eg with input from computer system committee Dale & Habib 1991).

One theme of note was that successful schools had a common attitude of "leading the way" with new technology (Dale & Habib 1991). Unlike the research on intranets in organisations there is no emphasis on the role of individuals. Instead there is greater emphasis on strategic change with the necessity of management support and involvement of users at an early stage of development. The difference is that content comes defined as part of the management system whereas with an intranet content develops with use.

2.5.6 Conclusion on intranets

What this review of the literature on school intranets would seem to suggest is that there is a range of reasons for why schools may be interested in developing intranets. Intranets in the business field may be very sure of their own identity (Vandome 1999) but there appears to be several potential identities for an intranet within education. Schools are unlikely to have had the benefit of intranets for as long as many businesses. The stage models as found in the business world will be a useful guide but the unique aspects of the educational context demands that an open mind be kept. The business world provides insight into some roles for librarians. The next section will look specifically at what is known of intranets and the role of the school librarian.

2.6 The role of the school librarian and the intranet

The role of the school librarian will now be discussed in relation to school intranets.

2.6.1 Resource provision - The information management role

The role of Internet mediator, using the intranet to download or point to relevant Internet sites is one possible role for the school librarian (Herring 1999). The intranet has the potential to extend the librarian's role in whole school resourcing. The library catalogue could be made available on the intranet throughout the school. Departments could be encouraged to place their collections on the library catalogue. Take this a step further and the catalogue could be developed into a common access point for all electronic resources including the Internet (see eg Eisenberg 1996). The intranet therefore could overcome one of the problem "issues" of school librarianship.

Schools in Australia have taken this much further by using the catalogue on the intranet to direct staff to a wide range of school resources, beyond what we would traditionally regard as library resources. Websites, word processed documents, presentation software, HTML documents and scanned items such as newspapers, in-school produced materials, revision papers etc can all be captured and accessed via the library catalogue. These are examples given by schools using one particular intranet system MASTERfile's "Edtranet". It has been developed specifically for education alongside "AIMS for Windows" a library automation package (Bell 1999). Page talks of this system replacing the school librarian's "vertical file" (Page 1999). However a number of the above examples are beyond what is kept in a typical SLRC vertical file. The importance here is the emphasis given to information management on a school-wide basis. For one librarian it has ensured the library has a long-term resource management role in the school (Bell 1999, p.18).

There is evidence that once an intranet is in place the opportunity of using it with major project work can be a real advantage. A project on "Japan" involving 260 pupils gave such problems for resourcing that alternatives had to be considered (Wells 1999). The intranet was seen as a way of reducing pressure on the SLRC and ensuring access to a variety of different information resources.

As schools give more consideration to information sources there is the potential for online subscriptions and CD ROMs to be added to the intranet. An alternative possibility is that librarians may have reduced control in selecting reference books as online reference tools

may be purchased centrally from external sources (Mabey 1997). It may also be that an intranet library will require information rich resources. It has been suggested that an intranet will increase the range and type of journals available (Herring 2000b). In addition to core stock (eg essential curricular materials, atlases, encyclopaedias), an intranet may provide a curricular collection (to meet the needs of the curriculum as taught in that specific school) but the most dramatic suggestion to resourcing would be the ability to buy into an elastic collection for the school intranet (eg pay for access to Chemical Abstracts for three hours to meet specific needs) (Loertscher 2002).

Loertscher offers a view of a digital school library intranet with personalised information spaces to meet the specific needs of students and teachers, eg pupils will only see materials which are suited to their subject needs and age levels (Loertscher 2002).

School librarians may use the increased availability of journals to customise their current awareness to individual members of staff by sending emailed articles (Herring 2000b). Wake talks of saving teachers' time by emailing useful information from educational list serves (Wake 1999b). They are also

“an opportunity to ask for advice from those with more experience, share good practice, and receive technical support from those with more detailed knowledge of ICT applications”
(Small 1999, p.65).

An intranet may allow the librarian to develop specific personalised current awareness pages targeted at specific teacher needs.

2.6.2 The instructional role

Will the advent of the intranet change the progress that school librarians have made in being part of resource based learning? If pupils are accessing the information sources via the intranet in the classroom they may not be physically entering the library building (eg Herring 2000b). There may not be the same opportunity for librarians to give “incidental and individualised guidance” (Debowski 1997, p30) or be involved in the instructional process.

Wake argues that the intranet can contribute to a school's cross-curricular information skills programme by addressing the increasing need for information skills required by a wide range of information technologies (Wake 1999a). Hale Grammar School's intranet is offered as an

example of how a school intranet can facilitate the development of “whole school philosophies and new learning environments” (Wake 1999a). The teacher librarians have provided templates for on-line assignments such as providing a strategy for searching, forms for evaluating on-line resources and standard referencing layouts. The key point is that these are available by hyperlink at the point of need. The intranet technology with the information skills support provided by the teacher librarian has become an aid in the student’s learning strategy (Wake 1999b).

The “Japan” project also illustrates how learning structures such as the project outline, aims and activities, information on presentation and assessment can be made available with the information resources on the intranet (Wells 1999). The role of the librarian in developing these learning structures is not clear from this article but the implication is that it is the teachers who were paramount in providing these. The “Japan” Project had two outcomes; the standard of marks was noticeably raised and more students were using the LRC, where the librarian was on hand to provide support. It does appear that the existing method of learning (resource based project work) and the cooperation between staff in different departments (Geography, ICT and the library) were important to the development of the instructional website. For the librarian “it helped to strengthen and reinforce the curricular input and status of the LRC” (Wells 1999). From this example and from other writers it is clear that any work on instructional websites cannot be undertaken by the librarian alone (Wake 1999b; Herring 1999).

2.6.3 The technology roles

There were two main roles identified in the literature of school librarianship and intranets, that of manager and content creator.

2.6.3.1 Content : organiser and manager

Ryan cites Burrows as stating that the building of the intranet framework should be the role of the information professional (Ryan 2000). Librarians are “logical partners in the development and management of a school information system or intranet” (Fankhauser 2000, p.204) and should work with teachers to decide what the students should see on their screens (McKenzie 2000). School librarians are trained at looking at information sources and organising materials for the ease of users. In the Schools Online Project the intranet at Sawry Common College grew to over 200 megabytes of data, equivalent to eighty thousand A4 pages of text in 2 and a half years (DTI 1998). This is a large amount of data and such an intranet would require managing. Useful resources will have to be found, evaluated and

placed on the intranet, but they must also be managed in such a way that the users (teachers and pupils) are directed towards resources which meets their needs.

2.6.3.2 Curriculum content creator

In the "Japan" Project, the librarian kept to a resourcing role in developing this instructional website. Originally the ICT department identified websites to be included (though many librarians are capable of this) with teachers providing the final verification. Actual web page development and upload to the intranet, was again done by the Computing department. This librarian's role was in providing information about library resources to support the project and then in being available to help pupils use the website. It has been suggested that school librarians could have a more technical input into the development of instructional websites and will have to develop the skills necessary for this (Herring 1999).

The Schools Online Project found that information on the Internet often required work by teachers in order to make it useful to students (DTI 1998). This role has been described as

"filtering, re-packaging and validating information on behalf of users who do not have time to select for themselves from the total package of Internet worked information which faces them" (Mitchell 1996, p.84).

Will teachers have time to filter and validate the plethora of information on the net? One of the failings identified in the School Online Project is that they did not get schools to create and share resources. This was put down to the steep learning curve and the time available. It was found to be a high cost in staff time to identify, download and edit materials. There was no mention in the final report on the role of school librarians to provide this. Considering how magazine articles, pamphlets etc are commonly collected together on popular topics by most secondary school librarians the "filtering" and "validating" could be argued to be a continuance of the current role (Debowski 1997). Debowski describes the "packaging" of information as new and certainly if this requires editing and reworking of content then this would appear to be taking the role further than previously (Debowski 1997).

In the Schools Online Project a CD ROM was sent to each school with the aim of giving each school's intranet a curricular boost (DTI 1998). The CD ROM had information on topics such as drugs, tornadoes, 2nd World War material and catholic saints. Bell states that what will differentiate one school intranet from the next will be the quantity of quality content (Bell 2000). When providing intranets will education authorities consider supplying

quality information resources, or support advisors to develop and provide these resources on the intranet? Is it possible that this is a role for the School Library Service?

As with the librarians in organisations, school librarian could be involved in the creation and storage of “original” local materials to meet the needs of the curriculum (Dow & Todd 1997). School librarians may already archive local material. The intranet allows the opportunity to package it in a form which permits wider educational use of the material. In the UK there is evidence that schools are using web technology to produce original work. Highdown School in Berkshire includes in their website an original interview with an author on the role of women during the war (cited in Herring 1999).

If school librarians are to be involved in this way in intranet development they will require high levels of ICT skills. It is not just the knowledge of how to create the web pages but also how to upload them to the system. Debowski (1997) writes that “access is power” for the school librarian.

2.6.4 Conclusion on the role of the school librarian and the intranet

Writers see a clear change in the resource role which has come with the development of ICT. In the Libraries of the Future project the librarian was seen as a guide rather than a gatekeeper to information sources (NCET 1996). The key change is in providing the guidance and instructional support to make the best use of electronic information resources. Winzenreid talks of a librarian whose task it is to “collect, catalogue and disseminate information effectively from many sources to users with many needs” (Winzenreid cited in Miido 1997). This role is an active one, organising information and pushing it to where it could be used. What the intranet may do is move this role from one within the library to a role throughout the whole school.

The literature also appears to suggest that school librarians may have a role beyond guiding and supporting the users, to working more closely with teachers in developing the content. The intranet technology could be responsible for encouraging a closer association between the resourcing role and the instructional role. Wake suggests

“a school intranet has the potential to provide the librarian with a real and meaningful role recognised by others, in a changing school environment”
(Wake 1999a, p.14).

The possible demise of the school librarian has also been suggested as one of a number of potential outcomes to intranet development (eg Herring 2000b; Simpson 1998).

Clyde writes that

“The skills of information management, information organization and information use that are part of the professional repertoire of the school librarian are skills that are very necessary for the implementation of a successful intranet”
(Clyde 1998, p.36).

It seems obvious the school librarians should be involved in planning for school intranets and have the potential to contribute on a number of levels to the development and use of the intranet. During the course of this research, work has appeared in Australia on the effect of information technology on the role of the school librarian (Mallin, Lindin & Burns 2001). What emerged was the idea of the "hybrid" librarian with the ability to adapt to changing demands and with a "willingness" to push boundaries.

The potential of the intranet has been discussed but there is a lack of empirical research in this field. As has been shown there are detailed examples in the literature from Australian schools (eg Wake 1999a; Wake 1999b; Bell 1999; Page 1999) and a few examples in the UK (Wells 1999; Herring 1999). It should be kept in mind that no direct comparison can be made with the Australian evidence as these are teacher librarians, often in private schools which employ a team of teacher librarians. What has been surprising is the lack of mention of schools with intranets from the United States. A short article by Jacobson (Jacobson 1997) does little more than indicate a number of schools which have intranets.

2.7 Theoretical perspective on the social impact of computing

Consideration must be given to the variables to be measured. The literature was reviewed in order to uncover the different theoretical perspectives which would lead to an understanding of the area under investigation. The theoretical perspective will bear a direct relationship on the questions to be asked. The literature review on the role of the school librarian did not identify a theoretical perspective which would guide this research. Where theory is evident it is in connection with the learning process. But the key change in this research is the introduction of the intranet, a technological innovation. This guides us to writings on the social impact of computing.

2.7.1 Social impact of computing

Kling states that

“to identify the social impacts of computing one must have, at least implicitly, a theory of the causal powers that computerized systems can exert upon individuals, groups, organizations, institutions, social networks, social worlds, and other social entities”
(Kling 1980, p 62).

A number of writers have identified perspectives which have been used by researchers looking at the social impact of technology on organisations (Hiltz 1992; Kling 1980; Mowshowitz 1981; Zmud 1979). Hiltz classifies these as four separate approaches, Kling identifies two major approaches but within which there are at least six perspectives whilst Mowshowitz identifies eight approaches. The four broad approaches as identified by Hiltz will now be discussed.

2.7.1.1 Technological determinists

The first identifiable group is the technological determinists (Hiltz 1992), technicians (Mowshowitz 1981) or the broader systems rationalists (Kling 1980). What they have in common is a concern with the technology. For this group system design, implementation and software are crucial in determining the success or failure of a system. Kling's systems rationalists “emphasize the positive roles that computer technologies play in social life” (Kling 1980, p.63). Efficiency and an interest in the capabilities of new technology are defining characteristics of this group. As Mowshowitz and Kling argue, it is a difficult perspective to sustain when studying the social aspects of technology. However it is a viewpoint which is often identified with “designers and promoters” (Mowshowitz 1981, p.149) of systems and a rationale which has been particularly associated with education

where there has often been a lack of empirical evidence that systems have met educational aims (see Conlon 1997). Mowshowitz describes technicism as mixing “optimism and entrepreneurial spirit with engineering tradition” in a world “full of antagonists who exhibit a misanthropic resistance to innovation” and which the technician has a “duty” to overcome (Mowshowitz 1981, p 148). Since much school intranet development is instigated by local government in order to meet national government requirements, it is quite possible that this type of division may occur if those in schools feel that the intranet is being imposed on them when they do not see a need for it. If the technician approach is to be applied to the introduction of intranets then questions should relate to its purpose and whether it meets the needs of its users (as in Dale & Habib 1991).

2.7.1.2 Psychological differences

The second approach Hiltz identifies is that of the psychological or individual differences. An analysis of the empirical literature on influence of individual differences on MIS (management information systems) success found that individual differences do indeed “exert a major force in determining MIS success” (Zmud 1979, p.975). Age, gender, education, skills and attitudes may be significant. Attitudes to the technology could be displayed through enthusiasm, willingness to take risks and anxiety levels. From this perspective it would be expected that within all schools there would be differences in the uptake of the intranet as teachers and head teachers each have different expertise and interest in ICT. The role of the librarian would differ according to background, training, their own personality and interest in the technology. One of the requirements would be to look for librarians who would meet these different characteristics.

2.7.1.3 Human relations

The third approach Hiltz terms “human relations.” From this perspective the groups and associates with which a person works will be the determining factor in the success of a new technology. Within schools an ICT working party, any strategies which schools adopt to support individual teachers in technology use such as a “buddy system” and departmental groups might affect the development of the intranet. For the school librarian questions relating to collaboration with different subject departments and to the support of the School Library Service would help shape the role that the librarian takes on. Hiltz in her study on the virtual classroom sees style of teaching as having an effect (Hiltz 1992). Likewise it could affect the intranet, if the teacher is accustomed to integrating computers in a constructive way into their teaching. This would also affect the role of the librarian where

teachers accustomed to resource based learning may be more likely to use the library (eg Valentine & Nelson 1988). With this perspective there could be differences between schools, despite the implementation of similar intranet infrastructures. Within schools you might expect to see strong departmental differences in the use of the intranet. For the librarians there may be a higher involvement in intranets where the librarian has a history of working closely with teachers and is a member of different working groups within the school. Most factors affecting the role of the school librarian in previous research have come from this group (see section 2.4.2.7).

2.7.1.4 Systems contingency

The final approach as outlined by Hiltz is that of systems contingency (Hiltz 1992) or interactionist (Markus 1983). This would say that no single approach will fully account for all the differences in the development of an intranet or the role of the librarian. This can be related to the “package” (Kling 1980) and “pragmatist” theory (Mowshowitz 1981). To fully investigate the social impact of the intranet it will be necessary to ask questions which allow for all of the main approaches as identified by Hiltz to be investigated.

2.7.2 Educational change

This social perspective tells us that we want to study intranets and the role of the school librarian in terms of the technology, the individual differences of the key people and the human relationships which occur within the school. The broad field of study is that of education and hence there is a need to look at educational change. From writings on educational innovation (Fullan 1982; Fullan & Stiegelbauer 1991) and from the introduction of computerised administration and management in education (Visscher, Fung & Wild 1999) it is clear that schools cannot be studied on their own without regard to wider influences.

Each school exists within a local education authority which will be influential in introducing the technical infrastructure and the guiding policies and structures to support this. External to this are the greater influences of the curriculum and of national policies as discussed in the literature review.

The works of Fullan are widely quoted throughout the literature on educational change, specifically in looking at factors affecting change. Fullan views change as a process. Change is seen as complex (Fullan 1982; Bomburg 1997). Change takes place over three phases – initiation, implementation and integration or incorporation (Fullan 1982). This study is

happening just as there is a wider introduction of intranets in Scottish schools. It is expected that schools could be at any of these three phases. Fullan's division of characteristics into clusters is useful.

- Characteristics of change- the innovation
- Characteristics of school district level
- Characteristics at school level
- External characteristics

(Fullan 1982).

This appears to fit the context of understanding an educational innovation within the Scottish system. Given the importance of the local education authorities in placing the infrastructures in school and given the external impetus which is known to come from government these would seem to be a logical grouping of variables for this setting. It is also clear that these groupings of characteristics are not unrelated to a study from the systems contingency approach of Hiltz, in that it is taking a holistic view of the innovation. Within characteristics at school level the research must allow for the "individual differences approach" and the "human relations" approach. This enables study of characteristics of key people and the different groups and strategies at work within the school.

2.8 Conclusion on the literature review

This review has covered a wide spectrum of literature on education, intranets and school librarianship. The curricular changes in Scottish education have seen an increased focus on individualised learning for pupils with emphasis on ICT skills and independent learning. Although projects have shown that ICT and learning can be of educational value there are clearly some doubts. An intranet may utilise a variety of individual technologies and would appear to fit with constructivist learning as a tool where learning can be structured to meet the needs of different students and allow for a variety of learning approaches. But a school intranet may offer more than just a curricular tool. The literature review has identified that school ethos, parental communication, the school as a learning community and the more practical administrative needs of education authorities may all be relevant to an intranet. This would suggest that potential for schools to develop their intranets in very different ways. This research will identify how intranets are being used in schools and the key factors in that development.

The literature on librarianship and intranets suggests that the role of librarian as information manager will be relevant to the intranet with the potential of new roles in content creation. This may move the school librarian from the confines of the SLRC to a whole school information management role. This research will identify the key roles and look for an explanation to how they have developed.

3 Methodology

3.1 Qualitative research

A critical analysis of qualitative research indicates that it

“entails immersion in the everyday life of the setting chosen for study, values and seeks to discover participants’ perspectives on their worlds, views inquiry as an interactive process between the researcher and the participants, is both descriptive and analytic, and relies on people’s words and observable behaviour as the primary data”

(Marshall & Rossman 1999, pp.7-8).

Qualitative research is concerned with understanding people’s perceptions of their social world. Qualitative research has been “advocated as the best strategy for discovery” or “exploring a new area” (Miles & Huberman 1994, p.10). Historically it has been widely used within the fields of sociology and politics but in the latter half of the twentieth century it has become more common within the field of education. In particular the shift within educational research from quantitative to qualitative methods has been associated with educational policy reforms of late 80’s and early 90’s (Hammersley 1993). Research reports in school librarianship and in particular on the role of the school librarian have used a variety of qualitative techniques with questionnaires to education authorities (eg Howard & Hopkins 1988) and interviews involving leading participants in schools a common feature (eg Valentine & Nelson 1988; De Silva 1991). Qualitative methodologies are therefore recognisable research methods to use in this field.

Quantitative methods, through a questionnaire (Bourque & Fielder 1995; Fink 1995), were used to identify potential schools for interview (Appendix 1). Within the interviews in schools the “intranet content sheet” was used to provide information on what was on the school intranets and to further questions on how it was used (Appendix 2). This did not answer the “why” and “how” questions which were necessary for understanding the factors involved in intranet development or the role of the school librarian. An objectivist approach through quantitative methods would merely have supplied the answer to “what” and “how many.”

The methodologies and methods employed must be justified by the purpose of the research and by the assumptions of reality held by the researcher (Crotty 1998). A positivist approach assumes that there is one reality, a truth to be found. The reality in this research is the world of education, the schools and specifically the intranet. The researcher started with the viewpoint that there was not just one reality but that there could be multiple versions of this

reality (constructivist paradigm). People are key to understanding intranet development and roles therein. To get to as close an understanding as possible it is essential to know how individuals in each school interact with that reality as they see and understand it. This can only come from dialogue with key participants. It is the participants themselves who, through the use of language, are able to construct their versions of reality. Within constructionism it is accepted that "different people may construct meaning in different ways, even in relation to the same phenomenon" (Crotty 1998, p9). Symbolic interaction which aims to faithfully represent the reality of those studied (Crotty 1998) is the theoretical perspective which informs this study. Subjectivism is the other main epistemology found within qualitative research (Crotty 1998). Other theoretical perspectives within this area were dismissed which included phenomenology and critical theories. Phenomenology makes the difficult assumption that one can set aside one's own pre-conceptions and meanings (Crotty 1998). Critical theories such as feminism, Marxism and postmodernism also accept that multiple realities exist, but start with the viewpoint that reality is shaped by political, gender or modern day values. Within critical theory research it is considered that there are misunderstandings of the world which come from the oppression of groups. This subjectivist approach seeks to challenge and bring about change (Crotty 1998). In this research the aim was to understand the phenomena through the subjects understandings. There was thus an acceptance of the words of the subjects as they meant them and no desire to impose external values on them.

The specific methodology employed is that of grounded theory (Glaser & Strauss 1967), derived from symbolic interaction. Survey methods alone would not have provided the necessary detail nor allowed for exploration of topics. An ethnographic study would have limited the number of potential schools in which the research could have taken place. Although ethnographic research could have the potential to gather immense detail on a small number of cases, the nature of observation in schools and involvement with pupils, would have presented difficulty in school participation. Interviewing key participants is the chosen method by which this aim of faithful representation is achieved.

3.2 Grounded theory

The principle of grounded theory is systematic discovery of theory, firmly “grounded” in the data. Grounded theory provides us with “relevant predictions, explanations, interpretations and applications” (Glaser & Strauss 1967, p.1). Grounded theory concentrates on the “generation” of theory rather than the “verification” of theory (Glaser & Strauss 1967). Hence the researcher does not start with theories or hypotheses which can be tested but begins with “strict” data collection which leads to the development of conceptual categories. The first elements of theory are the conceptual categories and hypotheses which are generated by comparative analysis. The emphasis is on theory as process “as an ever-developing entity, not as a perfected product” (Glaser & Strauss 1967, p.32) and this is seen through the discussional form of theory presentation. The lack of use of theories within the field of school librarianship, the lack of research on technology relating to the role of the school librarian, and the fact that intranets are a new innovation all contributed to the decision to undertake a grounded approach. But importantly the nature of grounded research, the generation of theory and the potential to follow developing areas of interest should ensure that findings reflect the reality as found in Scottish schools.

Although one can study an area with "a sociological perspective, and with a focus, a general question, or a problem in mind" one should also "study an area without any preconceived theory that dictates, prior to the research, "relevancies" in concepts and hypotheses" (Glaser & Strauss 1967, p.33). A broad literature search was undertaken to assess potential theoretical fields to which the research could be applied (as discussed at the start of the literature review, chapter 2).

The literature review was carried out in tandem with informal visits to schools and education authorities, discussion on the OZTL-NET and LM-NET list serves, and a letter to the then Library Association Record requesting contact with interested school librarians. The discussions via OZTL-NET started with a general question and as responses were received further questions were generated. As schools in Australia were further ahead in terms of their development this allowed the researcher to consider potential scenarios. Within a new area of study this is important as "insight and understanding about a phenomena increase as you interact with your data" (Strauss & Corbin 1990, p.43). The key part of this grounding process was visits to five Scottish secondary schools. This was important in generating questions and building on information not solely emanating from the literature (Marshall &

Rossman 1999). The research did not start with any hypothetical statement but as an inductive design allowed

“the important analysis dimensions to emerge from patterns found in the cases under study without presupposing in advance what the important dimensions will be”
(Patton 1990, p.44)

This laid the foundations for the question schedule used in the formal research section. Data from these contacts and visits can be found in Appendix 3.

During the formal data collection (interviews at authority level and interviews in schools) the initial focus was on understanding the individual cases, before assessing patterns which emerged as cases were compared. Grounded theory demands that cases be revisited as new categories emerge (Glaser & Strauss 1967). This was always going to be difficult within the school system, where schools had to be persuaded to give of their time. For this reason the first year with the "informal" visitations was essential in developing the main broad topic areas to be covered. Return visits were difficult to arrange but many of the librarians agreed to continued contact by email. This data was added to the analysis. Ongoing data collection directed further data collection and analysis. Within the grounded approach this is appropriate as

“Joint collection, coding and analysis of data is the underlying operation. The generation of theory, coupled with the notion of theory as process, requires that all three operations be done together as much as possible”
(Glaser & Strauss 1967, p.43).

This initial theory building involved collecting data, asking questions of the data, comparing and contrasting, and starting to think about concepts (Strauss & Corbin 1990). As theory developed this controlled the data to be collected. This may be seen as a limitation within a restricted research programme, for it has been said that it is difficult at the out-set to state the length of time it will take to complete the research (Glaser & Strauss 1967). Completion comes as categories reach “theoretical saturation” when no more new categories emerge. Theory is produced firstly in the form of substantive theory which can then be compared to existing formal theories to test its applicability, or to develop new grounded formal theory (Glaser & Strauss 1967).

Another essential in the grounded theory methodology is the use of memos (Strauss & Corbin 1990). These were kept throughout and added to the analysis.

Glaser & Strauss's grounded theory (1967) has been criticised for both its failure to acknowledge implicit theories which guide work at an early stage and for lack of interest in testing of hypotheses (Silverman 2001). In defence it could be argued that theory should be clearly "derived from the data and then illustrated by characteristic examples of data" (Glaser & Strauss 1967, p.5). The system of comparative analysis is a strategy for generating theory and works towards answering the "testing" criticism. Searching for "negative" instances is another strategy which is helpful in developing hypotheses (Glaser & Strauss 1967). Other criticisms have concerned the difficulty of teaching grounded theory as a method, the potentially endless options for coding and comparisons and the difficulty in deciding when theoretical saturation has been reached (Flick 1998). In these matters the researcher must be careful to provide sufficient evidence of the method used, must prioritise in making lists of codes and comparisons and has to be honest about reaching theoretical saturation considering the context of the time limit to the research. The reader must be able to "judge the credibility of theory" (Strauss & Corbin 1990, p.258). Despite these criticisms, it has been claimed that the grounded theory perspective is the most widely used qualitative interpretive framework in the social sciences today (Denzin in Denzin & Lincoln 1998).

3.3 Methods

Within grounded theory a variety of methods can be used. These range from interviewing, observation and reading documents (Glaser & Strauss 1967). The first step was to identify potential authorities and schools. For this reason it was necessary to use a method not normally associated with grounded theory. Questionnaires would provide sufficient data from which authorities and schools for further investigation could be selected. They would not provide enough information for deep research nor allow for exploration of topics. Interviewing was seen as the best method for gathering data from a range of schools appropriate to grounded theory.

3.3.1 Questionnaires

A questionnaire was a logical way of acquiring information on what was happening in every education authority in Scotland. It would be impractical to interview all education authorities. A questionnaire would indicate which authorities had intranets in place in schools and could be approached for participation in the research. The results of survey

research may “be used to direct the researchers to individuals as instances for depth observation” (Fielding & Fielding cited in May 1997, p.108).

The questionnaires were piloted with 3 education authorities, to monitor ease of completion, quality of response and administration (Fink 1995). The necessity of receiving a high percentage of returns required that length of questionnaire be kept to a minimum. At the same time it was important that sufficient data be received to clearly identify leaders in school intranet development and authorities with different approaches to intranet development. For this reason a number of open questions were included. The first questions related to plans for intranets and time-scales within which schools would have access to these intranets. This was necessary for decisions on selecting schools. Questions on the purpose of the intranet, the content of the intranet and support given, helped to identify some of the factors in intranet development. This aided selection of three authorities who could be used in the interview stage and investigated in greater depth.

The questionnaires were analysed with the aid of Pinpoint, a computer package which helped in counting and display of data (Cole 1993). The small number of open questions were analysed manually by reviewing responses and breaking down into common categories (Fink 1995).

3.3.2 Interviews at authority level

The initial proposal did not include the interviews at authority level. The importance of the authorities became apparent during the literature review (see Fullan 1982) and during the informal grounding visits. It was realised that intranets were not appearing simply because a school was interested but that decisions for intranets were coming from authorities. The authorities were acting as the decisions-makers and promoters and hence their views would be important. At authority level the views of the School Library Service would also be relevant, as they were involved in both the appointment of school librarians and in supporting them with their work.

The interviews focused on the research questions, using the topics developed from the grounding process (Appendix 4). The interviews were limited to the two key players for this research - the intranet development officer (referred to as intranet officer) and the head of the School Library Service (referred to as library officer). Selection of the authorities was based on critical case samples, sites which would yield most information and which displayed the

key dimensions (Patton 1990). The three authorities investigated were selected from five possible authorities. The one factor they had in common was that they were all advanced in their intranet development.

The purpose of the authority interviews was not to explain all education authorities' policies regarding intranets but to help in continuing the progress towards a grounded theory of intranet development and the role of the school librarian. Therefore their use has to be seen within the context of the whole research project and how they lead onto the interviews within schools.

3.3.3 Interviews in schools

Interviews were held in fifteen Scottish secondary schools. As far as possible these were with the school librarian, a member of senior management and the ICT co-ordinator. In School 5 there was no ICT co-ordinator. In Schools 3, 4, 8, 9, 10 and 14 the ICT co-ordinator was a member of the senior management team. In two of these schools they were unable to identify another teacher responsible for ICT and argued that the senior manager could cover both points of view (8, 9). In this event only two interviews took place in these two schools. School 15 was added late to the research. After analysing the data from schools 1- 14 it was considered that not sufficient "longer serving" graduates with "excellent" ICT skills had been included in the research. Following the grounded process an attempt was made to identify other schools which had a suitable "longer serving" graduate. In an attempt to "test" the theory development on the role of the school librarian a repeat visit was paid to one of the schools used in the informal interviews during the grounded process. This took place in 2002 and was included in the findings as School 15. Only the school librarian was interviewed on his role in relation to the intranet.

In addition to the formal interviews, additional comments, further emails and supporting material (eg from relevant committees etc in Schools 1, 2, 5, 12) were all added to the research. In four instances comments made informally to the researcher from other members of staff during the visit were added as notes (Schools 1, 3, 6, 8).

3.3.4 Interviewing

It has been argued that interviewing is not simply data collection but data "making" or "generating" (Baker 1997). Data is given in response to a question and is shaped by that question. The purpose of interviewing is to "generate data which gives us an authentic

insight into people's experiences" (Silverman 1993, p.91). Three types of qualitative interview are widely recognised (Patton 1987).

- The informal /conversational interview
 - The topic/interview guide
 - The standardized open-ended interview
- (Patton 1987).

In the first the interviewer does not have set questions but allows the interview to develop from the natural flow of an interaction (Patton 1987). There are obvious time considerations to take into account with this type of interview, as it is not advantageous in gathering systematic data. In the standardized open-ended interview although the responses may vary, the standardized questions mean that there is little flexibility in probing, essential in a grounded approach (Patton 1987). The advantage is that it does reduce bias and allows replication in other studies. It was felt that in this research, lack of spontaneity and flexibility could limit some of the information sought. However some of the information required, with questions derived from the grounded visits of year one, was perfectly suited for a standardized interview (eg questions on school librarian characteristics- qualifications, years in schools; SLRC characteristics; number of networked computers etc).

This was combined with the interview guide (see Patton 1987, p.114 for style combination). The interview guide (semi-structured interview) has a list of topics or issues to be explored. If the same guide is used in all the interviews then there is the chance to gain some systematic data that can be compared. Again these broad topics were generated from the grounded visits and discussions of year one (Appendix 5). Topics were generally followed in a predefined order although occasionally the order would vary if the flow of the interview necessitated this. The use of a guide means that follow up questions to answers given should differ as each interview becomes a conversation. As new ideas were introduced respondents were asked to elaborate in their own words and invited to "tell me more about that" (Finch 1990, p.137). This is appropriate as

"the interviewer remains free to build a conversation within a particular subject area, to word questions spontaneously and to establish a conversational style- but with the focus on a particular predetermined subject."
(Patton 1987, p.111).

This adds to the “richness” of the data and the interest is in the differences within topics. Thus questions on involvement of the school librarian would differ according to individual circumstances. Questions on various support systems in the school would differ according to what was being used (eg an ICT working party, an ICT technician). There is a need therefore for the researcher to be “active” and “reflexive” in the interview if the method is to work in generating the required data (Mason 1996, p.41). It is up to the interviewer to ensure that proper focus is maintained, that information relevant to the research questions is acquired and that the utmost use is made of the flexibility of the semi-structured interview. The answers from the school librarians, ICT co-ordinators and head teachers were compared across interviews, accepting the limitation of total replication.

Patton warns against asking future-oriented questions (Patton 1987). These were asked as future role is a consideration for the school librarian and has training implications. However it is recognised that these answers will be speculative and less reliable.

As stated the grounded approach of year one had identified key topics to be included in the guide. By following the responses to general questions on what was happening in schools and by including open questions (eg on benefits and problems of an intranet) new issues could be raised which in turn could lead to new categories for consideration. Through the grounded approach these new categories must be considered and compared with previous interviews. As stated previously where there was the need to put new questions to interviewees, these were sent by email, to elicit a quick response.

3.3.4.1 Interview sample

Using a grounded approach it was essential that initial schools displayed as many variables as possible. This is within the boundaries of qualitative research as

“samples in qualitative studies are usually not wholly pre-specified, but can evolve once fieldwork begins”
(Miles & Huberman 1994, p.27).

The sample included schools from different areas around Scotland, but also included schools with different ICT backgrounds. It was a particular concern that not all the schools should be what is seen as “technology leading” schools or “pathfinder” schools as this could bias the data. Initially a number of schools were specifically “selected” for their intranet technology from information given in the questionnaire or from direct contact with the intranet development officers (Schools 1, 2, 8).

The researcher intended to follow a "theoretical" sampling pattern (Glaser & Strauss 1967). Schools fitting the requirements of key concepts were sought to "test" these. For this it was necessary to find male librarians, librarians of varying ages and schools known to be making use of specific strategies. As almost all authorities left participation in the research up to the individual head teacher it was at times difficult to find schools to fit theoretical sampling. For a variety of reasons some schools refused to take part in the study. There was early evidence of this in selecting the first school where an attempt to interview in one particular authority proved impossible due to the fact that a large number of the schools were heavily involved in another research project. In a later case, staff of a school where the librarian had been appointed and paid as ICT co-ordinator could not participate due to time commitments. School 5 was found as a potential substitute with the librarian appointed as intranet editor. It became obvious towards the end of the research that there was a need to find a longer serving graduate with good ICT skills to test the role question. Eventually it was accepted that there were no new schools appearing to fit this test and hence the necessity to look again at one of the schools used in the grounding visits. Not enough data had been gathered from that first grounding visit to fully satisfy the theory as it stood at the end of the research. The return visit was thus essential. Although frustrating, agreement to participate is a factor outside the researcher's control and particularly problematic in the field of education where many schools are inundated with requests to take part in research. Although some schools rejected participation it is considered that the alternatives found fulfilled theoretical sampling, as they met a particular requirement which the researcher was seeking.

Including three schools from each of the three larger education authorities in the sample has allowed for inter-authority comparison and more generalisation.

3.3.4.2 Interview pragmatics (Mason 1996: Patton 1990)

Interviews were held at times to suit the interviewees and the schools. Practicalities meant that interviews in schools which required the researcher to have an overnight stay, were held on the one day. In other instances interviews would be on split days at the schools discretion. In a small number of instances the school librarian insisted that the interview be held in the SLRC which could be subject to interruption (librarians 1, 10, 11). This was unfortunate and did affect the flow of the interviews. The approximate interview length was thirty to forty minutes for senior management, and an hour each for school librarians and ICT co-ordinators. Wherever possible the school librarians demonstrated use of the intranet,

particularly the library pages. Notes were taken of comments made and these were added as memos to NUD.IST. Interviewees should have full information on what the study involves (Miles & Huberman 1994). All interviewees were sent a subject information sheet (Appendix 6) and topic schedule (see Appendices 4 & 5) in advance of the interviews. Interviewees were given the opportunity to ask questions before the interview and were told that information would be confidential, with no schools or individuals identified. A number of librarians sought reassurance on this confidentiality during the interviews before responding to questions.

Interviews were taped and notes taken. This helped to remind the researcher of follow up questions, where an immediate interruption would have affected the flow of the conversation. The notes were also useful on one occasion when the tape player developed a fault during the interview, and in a small number of other instances where voices were unclear. Following each interview, a short contact summary form (Appendix 7) was completed which included immediate impressions of key points of interest (Miles & Huberman 1994). This was used as part of a short memo attached to interviews on NUD.IST.

Transcriptions followed as soon as possible after each interview. When a large number of interviews occurred close together this could mean a delay of several weeks before the last interview was transcribed. Verbatim transcriptions were undertaken with any loss of sound indicated in the script. These were then typed and prepared in the format as required by NUD.IST.

3.3.5 Analysis

By its very nature qualitative research produces a large quantity of raw data. The NUD.IST computer package was used to aid full analysis (Richards & Richards 1987). As has already been stated grounded theory requires ongoing analysis. Due to the fact that interviews in schools were generally held in clusters (ie at ends of school terms) it was impossible to have all interviews in one school transcribed and analysed on NUD.IST before the next set was due to start. A variety of strategies were utilised in analysing the data before input into NUD.IST. Grounded theory requires a constant comparison method of new evidence to previously classified incidents (Glaser & Strauss 1967, p.109). To aid the theory building it is suggested that the researcher continuously steps back, asks questions of the data and remains sceptical (eg Who, When, Where, What, How, How much, Why) (Strauss & Corbin

1990). These were the first key strategies employed in looking at individual schools. It was not a case of counting but of seeking explanations, understanding the "socially constructed nature of reality" and the "situational constraints that shape inquiry" (Denzin & Lincoln 1998, p.8). Tapes of interviews were replayed as much as possible to allow for ideas, and associations to permeate and the researcher to contemplate key questions. Glaser and Strauss state

“Since coding qualitative data requires study of each incident, this comparison can often be based on memory. Usually there is no need to refer to the actual note on every previous incident for each comparison”
(Glaser & Strauss 1967, p.106).

These first level strategies aided analysis of ongoing comparison with previous interviews, until time allowed for full analysis on NUD.IST. This then became the second step of analysis in this research. As new data was collected it was systematically coded, then entered onto the system. The coding on NUD.IST was descriptive, open coding. NUD.IST provides a tree like framework for coding. Fullan's (1982) framework broadly related to the situation of education in Scotland and use of this helped provide a logical breakdown of data. There was clearly going to be a greater volume of data relating to school characteristics, hence with the focus of this research in mind, two additional bases were added to the tree structure on the library characteristics and school librarian characteristics. These 6 groups formed a coding structure which eventually produced over 270 descriptive categories.

Table 2 outlines the six bases with their main categories. Categories could be broken down further and new categories added as required. For example within the category on technology roles for the school librarian, a number of codes for specific roles were created (eg intranet builder, technology support, content creator etc) as these roles appeared in the data. The aim was to code the data systematically and then to be able to pull all relevant data on one topic and compare across all schools and all interviews. This was done through the reports which NUD.IST produced. A feature of NUD.IST is its ability to give multiple codes to the one piece of text and the capability to re-code. NUD.IST can comply with the goal of grounded theory by allowing the emergence of themes from the data and not relying on preconceived ideas (Richards & Richards 1987). At all times data could still be viewed "whole" within the original interview context on NUD.IST when necessary. The advantage of using a computer system is the reduction of time in manually manipulating the large volume of data and allowing flexible and systematic checking of incidents.

Intranet characteristics	The technology: technical set-up: access History/background Intranet use: communication: resources: management: administration: extra curricular Intranet problems: buildings: finance: staff: technical issues Future developments
School characteristics	Culture: innovation: ICT: teaching style: community Key people: head teacher: senior management: ICT co-ordinator: Other roles Strategies : Groups: policies: training: Development Plan: technicians: funding: information skills: evaluation
Library characteristics	Library personnel: library assistant: pupil helpers: adult helpers: library committees Physical features: access: size: budget: ICT Use of LRC : opening hours: scheduling: departmental links Library content on the intranet: homepage: URL support: instructional web pages: library catalogue
School librarian characteristics	Personal characteristics: gender: qualifications: experience: training: attitude Roles : resourcing: technology: instructional: literacy development: promotional: future role Future education:
Authority characteristics	Intranet use communication: resources: management: administration Strategies: Pilot schools: Groups: policies: funding: training: subject specialists: technicians: School Library Support Services:
External characteristics	NGfL: HMIE: Scottish curriculum

Table 2. Coding structure used with NUD.IST.

Themes had already emerged by use of the grounded theory process in particular through the constant asking of questions of the data and the listing of causal statements. Strauss and Corbin suggest use of a causal model for grounded theory analysis (Strauss & Corbin 1990, p.99). An example of this would be “Due to support in the library the librarian is able to spend time with departments on instructional materials for the intranet.” Lists of causal statements were produced for each school. By then taking each of the sections apart (eg causal conditions -support- what type of support, duration of support, what tasks did the support provide) and further segmenting, it was possible to make accurate comparisons between schools. The NUD.IST reports were helpful in allowing full comparison. One of the dangers was the potential to become obsessive with lists of categories in separation from the data. In this grounded theory process only the most promising categories from these causal statements were selected and their relationships investigated (Strauss & Corbin 1990). As

these causal statements and categories were reviewed, questions would continue to be asked of the data. Within intranet development the first promising categories identified were on computer access and internal training. As the research progressed to include more schools these categories became less relevant. The open, descriptive coding of NUD.IST was replaced by conceptual terms to describe what was occurring in the data (eg in the previous causal statement example it became clear that an appropriate term to describe the action of that librarian was activator). The key concepts on intranet development are outlined in table 3.

Category	Concepts developed
Key people ICT co-ordinators School librarians Pupil helpers/intranet group	Activators Activators/Mediators Gatherers
Culture of the school	Supportive: internal encouragement: power vacuum
School strategies	Organic: Bottom-up development
Intranet use	Content gap Emergent when related to internal needs

Table 3. Key concepts relating to intranet development

Category	Concepts developed
Personal characteristics Experience (Date since graduation) Training /ICT interest Attitude	Initiative taker + personal contribution Self-training Willingness to make visible
Librarian role General role Resourcing role	Flexibility Centrality: Relevancy: visibility
Library characteristics Departmental links LRC content on the intranet- URL support Instructional web pages	Isolation versus collaboration: visibility Educational relevancy: Scaffolding Packaging
School Library Support Service Subject specialists	Expert searchers

Table 4. Key concepts relating to role of the school librarian

The key concepts developed for the role of the school librarian have been outlined in table 4. These concepts emerged as the data was analysed through the causal statements. It was

through these conceptual terms that the theorising could be fully developed. This was the source for the "discussional form" of the theory presentation (chapters 8.1 and 8.2). Direct quotation was used to allow the reader into the minds of those interviewed (Patton 1990). This is comparative analysis placing emphasis on theory as process (Glaser & Strauss 1967, p.32).

3.3.6 Model

A model can be described as

“an abstraction from reality that serves the purpose of ordering and simplifying our view of reality while still representing its essential characteristics”
(Frankfort-Nachmias & Nachmias 1992, p.44).

A model was used to clarify and make explicit the significant relationships in intranet development. The model is a tool which management in schools and at authority level should be able to use to identify where schools are in their intranet development and to aid in decision making about how to progress that development.

3.3.7 Validity

It has been argued that triangulation is an alternative to validation of qualitative research and that

"The combination of multiple methods, empirical materials, perspectives and observers in a single study is best understood, then as a strategy that adds rigor, breadth and depth to any investigation"
(Denzin & Lincoln 1998, p.4)

Within the three larger education authorities involved, three schools were selected for participation. Within schools, data was triangulated where possible with three people in different positions giving their views on the intranet and the role of the school librarian. This should allow some support for the theories which have been developed. This "strategy" is questioned by other researchers (eg Mason 1996; Silverman 2001). They place greater emphasis on reliability and generalizability.

3.3.8 Reliability

Reliability can be addressed to some extent by applying standardised techniques and also by being open and explicit with the methodology. All the interviews were prepared for and treated in the same manner. Within the research methods there was a deliberate attempt to provide a running record of ideas for subsequent analysis and interpretation (Kirk & Miller

cited in Silverman 2001). Reliability has to some extent been met by recording of interviews, personally transcribing interviews and utilising extracts within the findings (Silverman 2001). The questionnaires were piloted.

A recognised method of testing reliability is by feedback to informants (Guba cited in Miles & Huberman 1994). A focus group of school librarians was considered as a strategy for presenting and testing the findings. Unfortunately time did not allow this to happen. This could be considered by future researchers.

3.3.9 Generalization

The use of maximum variation and theoretical sampling was intended to support generalization. Silverman suggests the use of "deviant" cases in addition to selection of cases to support theory development (Silverman 2001). "Deviant" cases are those which have "negative" features. It was always the intention to include both librarians committed to the intranet and those less interested in ICT. Schofield suggests that in order for research to be generalized it should study what is, what may be and what could be (Schofield 1993, p.98).

- What is : in terms of typical dimensions - (a number of schools fit this)
- What may be: "leading edge" where innovation may be in its infancy but likely to be common in the future (Schools 1 and 12, both appear to be "leaders" in technology)
- What could be: locating cases that are "ideal" or exceptional to see what is going on (Schools 2 and 5 fall into this group in terms of the role of the school librarian)

The research initially concluded with School 14. However during the period between agreeing to participate and the actual interviews, School 14 decided to change their Service Provider with subsequent loss of their intranet. Their inclusion was not seen in terms of a "test" of the theory but was viewed as producing alternate interpretations of the value of an intranet which would help with generalization. Later School 15 was added but only with the librarian interviewed. This was added specifically to "disprove" a factor identified as key to explaining the librarians' role. Generalizations are considered relevant to the context of Scottish education. Generalizations beyond this specific community to a wider population of all schools is more contentious and not considered to be applicable to the role of school librarian.

3.3.10 Ethical issues (Mason 1996; Patton 1990)

Permission was required from all Directors of Education for the questionnaires to be sent out (Appendix 8). For both interviews at authority level and interviews in schools, all relevant education authorities were contacted for permission before formal contact was made with the individuals (authorities) (Appendix 9) and head teachers (schools) (Appendix 10). In some instances this was a straight-forward procedure of sending a covering letter outlining the research. In other cases it involved completing application forms with details of methodology and topic areas to be covered. This was a time consuming but necessary process.

4 Questionnaire Findings (see also Appendix 11)

Twenty-eight responses were received from the thirty-two Scottish education authorities.

4.1 Plans for intranets

All Scottish education authorities who responded indicated that they will have an authority intranet which schools can access at some point. At the time of this questionnaire in early 2000, five authorities had provided secondary schools with their own intranets. Four authorities said the decision was left to individual schools. These authorities provided the researcher with evidence that potential schools with intranets could be found.

4.2 Stage of development

The request for stage of development and completion date was intended as an aid in selecting authorities for interviews in schools. A number of authorities were unable to give dates. One authority had faced delays of six months caused by “corporate policy” in the provision of network based Internet access and added that “slippage like this makes me concerned about committing a date.” The results indicated that more schools would have access to an authority intranet before their own school intranets. In fifteen authorities, schools would have access to an authority intranet by August 2000 whilst only six authorities would have all schools with their own intranets in place by the same date. For this research the question must be posed, “does it matter whether it is a school intranet or an authority intranet which is investigated?” This will depend on the type of use to which the intranet is put. If it is an authority intranet which has mainly council departments and information relating to policy documents then this will be little used by schools. However an authority intranet which has been developed primarily with education in mind may be of as much interest as a school with its own intranet.

4.3 Purpose of the intranet

Authority intranet.

The majority of responses (21) saw the authority intranet as fulfilling both an administrative and curricular function with four authorities viewing the authority intranet as curricular only. A small number of authorities provided additional responses related to communication, conferencing and one of learning communities.

Although no authority yet had the authority intranet available from home, sixteen authorities were considering this, with one indicating that it would happen.

Schools with their own intranets.

Twelve authorities saw these as fulfilling both administrative and curricular functions, eight curricular only. A number indicated a wider purpose to their intranet by way of opportunity to display school information with communication and conferencing also mentioned.

Two authorities had provided home access to their school intranets. A further sixteen authorities were considering this, one with definite plans.

4.4 Types of information

A weakness of this questionnaire is the difficulty in accurately assessing what will be on the intranets when the question for this was left open. It was considered that a prescriptive list of types of information would be impossible to produce, was likely to change over time, would make the questionnaire bulky and discourage respondents. It must be accepted that the answers in this section are only an indication of what might be available on intranets.

4.4.1 Content - Authority intranet

The most frequently mentioned application for the authority intranet was "discussion/bulletin boards" and links to curricular sites at seven counts each. The bulk of the remaining suggestions for content on the authority intranet was information already available in paper format for example - policies (6), memos, circulars, forms (6), job vacancies (2). In addition one authority stated "it is the intention to transfer as much paper-based administrative/managerial documentation onto the intranet as possible." Only one authority specifically mentioned an MIS (management information system) for school administration as being part of their intranet.

4.4.2 Content - Schools intranet

For twelve authorities this information was not available whilst three indicated that it would vary from school to school. Suggestions covered a wide range of information which had previously been available in paper format such as school handbooks (5), policy documents (1) and PTA news (1). Some of this would seem to indicate that it was intended for parents (eg handbook, PTA news, local information) and access from home. A few mentioned pupil folders of work (3) and staff folders of work (1). Most school networks would be expected to include these functions. Information sources mentioned were curricular Web links (5), licensed software (5), careers information (1) and the library catalogue (1).

4.5 Surveys

Twenty-five of the twenty-eight authorities undertook some form of technology survey. Most commonly this covered hardware (19) and cabling/networking information (14). Eight included an audit of software, and two considered accommodation.

Far fewer authorities undertook a user needs survey (8). The responses varied from the use of “pilot” schools, to interviews with head teachers and ICT co-ordinators, whilst one authority concentrated on curriculum needs through the “Higher Still” demands. Amongst the “No” answers, one mentioned “considerable discussion” at all levels, another how school development plans informed the strategy group. One indicated that although no official survey was carried out, various teachers’ views were considered and added that “an intranet has to evolve.”

Although eleven authorities indicated that school libraries had been involved, few were able to comment on how they had been involved. Only in one authority did a range of school librarians appear to have had the opportunity to give their opinion through the “library ICT group.”

4.6 Support

Questions were asked concerning the main support strategies identified through the literature and early grounding visits.

4.6.1 Training

Not surprisingly those that answered “yes” to having provided training were primarily those with intranets in place. However five of those who said that schools already had access to either an authority intranet or their own intranet have yet to provide training.

Authorities were asked to specify or enclose relevant documentation on training. The responses were disappointing. From the answers given it would seem that training was limited in terms of who received the training (eg ICT co-ordinators, publishers at headquarters) and of what it consisted. In no instance did an authority state that training was to all staff, although one indicated that many teachers had accessed their course. Despite fifteen authorities having provided training, only four specified that this covered Internet skills, three mentioned email and three Publishers, with a further two stating the training

came from the company providing the specialised software. From comments added it was evident that authorities expected a large increase in training to take place under NOF.

4.6.2 Policy documents/guidelines

The number of authorities with policy guidelines in place was lower than the number of authorities who provided access to intranets (8 out of 15 for the authority intranet, 3 out of 5 for the schools intranet).

4.6.3 Management of the intranet

No authority was providing a full-time network manager in school. The most common system was to provide a network manager at authority level and an ICT co-ordinator with teaching commitments to manage their intranets (8). Five relied solely on their ICT co-ordinators (with teaching commitments), and one the ICT co-ordinator and the schools intranet group. Six authorities were managed by a network manager at authority level. Six authorities indicated use of PFI “managed services” in addition to either “ICT co-ordinator” or Network manager at authority level.

4.6.4 Technical support

A number of authorities had not made final decisions with regard to the form of technical support they were to give to secondary schools. Two authorities provided full-time ICT technicians in all secondary schools. Two provided full-time in some of their schools (in one of these it was indicated that it was in the larger schools) with part-time technical assistance in the remaining schools. Surprisingly only four other authorities provided part-time ICT technicians in schools. One indicated that it was in the process of evaluating a recently introduced system where the ICT technicians supported a “cluster” of schools (secondary, primary, special). Eleven authorities relied on central support services alone and seven on some sort of support from the Managed Service Provider. Only one authority appeared to have chosen to rely on a fully Managed Service.

The question regarding the satisfaction levels of technical support was deliberately set to allow authorities to express whether they felt it was an area of concern. Concerns which they raised related to the legacy of inadequate ICT support, the fact that ICT demands were growing with the development of intranets and the implications for budgeting. The issue of finding suitably qualified ICT technicians was not raised. Five authorities felt they had satisfactory technical support. Two of these five identified that schools were concerned

about technical support but as one put it, “we feel that a lower level of first time technical support is required at school level.”

4.6.5 Review system

Only one authority had a review system in place. Although this figure was not expected to be high it should be considered in context with the number of authority and school intranets in place (see question 1).

4.6.6 Supplementary materials

Three authorities supplied supplementary materials. One of these was information from the Managed Service Provider used by that particular authority. This literature emphasized how the schools intranet could be customised to meet the needs of each particular school. Both the authority intranet and the school intranet had areas which could be “locked off” for particular users. Included were annotated links to educational resources, giving teachers ready made access to these resources for the classroom.

Two authorities provided their policy plans for Information and Communication Technologies. In these the school library was identified as an ICT resource and the role of the school library and the school librarian within ICT literacy was noted eg “in secondary schools, the library can be a centre for ICT literacy.” One of the strategies given to reach this was greater collaboration between teachers and librarians. This indicates that the authority has recognised that the school library has a role within ICT developments in schools and stated this to schools.

4.7 Discussion

The questionnaire responses blurred the distinction between the authority and schools own intranet. It had been expected that more than one authority would view the authority intranet as administrative. It could be argued that if schools have their own intranets there is less need for curricular support on the authority intranet. Yet a number of authorities saw the authority intranet as curricular rather than administrative. Will the presence of an authority intranet with curriculum resources available, mean less need for teachers and school librarians to develop and maintain such resources on a school intranet? This could explain lack of training to teachers in schools on publishing software.

The lack of information on the content of the school intranets was disappointing. It would be surprising if content did not vary depending on the interests and needs of those in each school. But do schools understand the potential of an intranet? Are authorities providing that kind of information and vision? There was no specific mention of the integration of Web links into instructional websites. Perhaps instructional websites is a term which is not yet understood. There are commercial instructional websites available and some authorities may have been considering this under licensed software. As discussed in the literature review, instructional websites can be localised to the relevancy of a particular teacher's lesson needs and the resources of an individual school. Will there be examples of individual teachers in schools motivated to develop these? It would appear that authorities do not at the moment expect these to be an immediate part of a school intranet. However if the Managed Service is providing Web link materials, as indicated in one authorities supplementary material, this may explain why they were not concentrating on developing content themselves. There was no specific mention of online subscriptions such as news information services, journals or reference materials. Licensed software will be a problem for individual schools due to cost unless the authority has the financial support to agree licenses.

One of the uses suggested was discussion boards but it was not stated what they would be used for or who would use them. If these are intended for pupil use then there may be a need for a moderated system and strict supervision by teachers. Or it may be that these will initially be used by subject specialists such as ICT co-ordinators.

Further information is required on the specifics of the administrative function of the intranet at both authority level and school level. As discussed in the literature review many initiators of intranets view them as a potential for saving costs and cutting down on paper. At least one authority appeared to have this as a priority. If it is intended that all staff use it for administration then there is an assumption that they have access to a computer.

It was surprising that there was only one mention of the library catalogue. Many SLRCs in Scotland already have computerised catalogues. The recent COSLA standards outlined the contribution of the school librarian to information and study skills, to the development of ICT skills as well as the potential of managing curricular information resources in a school (COSLA 1999). All of these are relevant to the use of an intranet. It might therefore have been expected that there would be more evidence of constructive involvement of School Library Services or school librarians in the planning for intranets.

There was a surprising lack of user involvement in the planning for intranets. It may be that some authorities assumed that they already knew the requirements of its users and that there was no need for a user survey. Authorities may believe that if teachers have not encountered networks then they are unlikely to know what they want from an intranet. The policy provision regarding intranets was also low. Although many planned to provide these, it could be argued that they should be available to schools as they have access to the intranets.

It was not surprising that Scottish authorities were considering developing home use. It fits in with developments of increased parental access and involvement in schools discussed in the literature review. There is potential for the intranet to be a communication tool for parents (eg handbooks, policies etc) as well as a curricular tool for pupils accessing the intranet from home.

From the questionnaire there were low levels of technical assistance in many authorities. The number of computers in schools is increasing rapidly. Although teachers' technical skills will be increasing to some extent, if computers are to be used daily in the classroom and for administrative purposes then there must be the technical support to go with this. Although much of the management of the intranet may be done at a distance, (new software added, emails changed) it is unlikely that there will not be demands on an in-school person.

4.8 Conclusion

The questionnaire indicated that there would be potential authorities, which had schools with intranets. The responses to the questionnaire suggested that authorities have taken a technicist approach to intranets. The decisions appeared to come from the top, pushed by the government. The main effort was in providing the technology. From the responses and lack of supporting materials, authorities have put little effort into involving and supporting the users of the intranet. On the surface there appeared a reliance on external influences to make the intranet succeed eg the NOF training from the government, the evaluated curriculum links from Managed Service Providers. Yet the success of the intranet will depend on the use within the schools. A more detailed study of authorities will investigate whether this assumption of a technicist approach is correct.

Local authorities may be supplying more than basic technical requirements to meet government needs, but few authorities in the questionnaires appeared to have strong ideas of content. It had been hoped that authorities would be able to give more details of what was to

go on the intranet. Content may well and indeed should change to meet the needs of both the authority and schools. There appeared an assumption that with the presence of the technology and NOF training, these intranets will be used. This was particularly concerning when so many of the authorities considered the purpose of their intranet to be curricular. There appeared to be limited involvement of classroom teachers and school librarians in planning for intranets.

It is accepted that many authorities were at early stages in their developments. A number may say in response to the criticism of lack of training, policies etc that these can only be available once the necessary infrastructure and computers are in place. There is a danger that if schools do not have a clear idea of how they are to use the intranet (other than for communication and administrative functions) then only in schools where there are motivated staff and teachers interested in technology, will intranets be used to their full potential. What needs to be investigated further is how authorities plan to encourage take-up of intranets.

The questionnaire also adds to the evidence of the literature review which suggested that the role of the school librarian would not be given a high profile by education authorities in consideration of the introduction of intranets. This would suggest that much may depend on the profile of individual School Library Services and individual librarians.

4.9 The need for authority interviews

The questionnaire only skimmed the surface of intranet development in Scotland. At four pages and twenty-one questions it had been felt that these tackled the main issues relating to the topic. In an email from one of the respondents it was stated that:-

“You haven’t left space for delays caused by IT dept’s lack of understanding of education and timescales and the different requirements from offices!! I know a number of authorities with experiences similar to ours.”

There was obviously a limit to what could be asked in a questionnaire and this vindicated the need for a number of authority interviews.

4.9.1 Selection criteria

As stated in the methodology section critical cases were selected as sites which displayed key dimensions and would yield the most information (Patton 1990). From this questionnaire three authorities were identified which appeared to be more advanced in their implementation plans. Table 5 highlights their key dimensions.

Authority	Secondary schools	Notes.
A	8	Providing schools with own intranets and access to an authority intranet. Small authority.
B	21	Providing schools with own intranets plus authority intranet. Large authority. Use of a Managed Service Provider. Access to computers in suites. Mention of School Library Service involvement.
C	23	Providing extensive authority intranet. Individual schools to decide whether to develop their own intranets. Evidence of more consideration of content than Authorities A and B. Providing more training and technical support. Access to computers in classrooms.

Table 5. Criteria for authority interviews

5 Authority interviews: Findings

Interviews were carried out with the person responsible for intranets in schools (intranet officer) and the person responsible for school libraries (school library officers).

5.1 Key factors in intranet development

The findings from the authority interviews are presented under the two main research questions. This first section deals with the question of intranet development.

5.1.1 Intranet provision

All those interviewed considered that their authorities were providing an authority intranet. At the time of the interviews only Authority C had their authority intranet fully implemented across all schools. Authority A will eventually give all schools their own in-school intranet in a roll-out programme. In Authority C the schools had the infrastructure in place for an in-school intranet but will have to purchase an extra server and “build” these themselves. Authority B had a fully Managed Service which provided an intranet package from Research Machines for each individual school. Schools will be able to adapt this basic intranet, restructuring it to meet their own needs.

Two of the three intranet officers interviewed were adamant that the purpose of the intranets was educational: “The ultimate aim for us as an education service is learning and teaching and communication is an added thing” (Authority A). “It’s for teaching and learning. No other purpose as far as I’m concerned” (Authority B). Intranet Officer C placed more emphasis in the first instance on the administration functions of the intranet as “...a way of disseminating information, bringing staff in schools and across departments closer together” (*the departments referred to here are the Authority education departments*). During the interview he also gave examples of how the intranet was being used with pupils in learning and teaching. He considered that most schools would eventually create their own intranets, dependent on the financial resources of the school and personnel.

5.1.2 Content of the intranet

The findings from the questionnaire had suggested that despite the intent that intranets have a high curriculum use, authorities have put little effort into developing content for the intranet. The intranet officers were questioned over content of both the authority intranet and the schools intranet.

It became clear from discussion with intranet officer A that they were indeed at early stages of development of content of the authority (started in 1997) and schools own intranets. They were currently working on administrative functions such as in-service courses for teachers, internal publications and safety files (policies and procedures). Possible content on the schools intranets could include timetables, pupil registration and Records of Achievement (ROA). Authority B were further ahead with changes in process, such as finance, registers and exam information moving to become part of the authority intranet. It was expected that many internal publication such as bulletins, and job vacancies would become part of the Authority intranet "but that's a bit in the future." Content of the in-school intranet was up to individual schools.

Authority C gave the clearest indication of the division between the authority intranet and the schools intranet. Material of interest to all schools would go onto the authority intranet whilst local intranets in schools would be used for information pertaining to their individual schools. In deciding what would go onto the authority intranet a factor considered was how many people were likely to use that information. It was clear that there was already a great deal of content available on the authority intranet. This included their on-line ICT training course for teachers, a pupils' section with study guides, links to local organizations, job vacancies and finance. It was now policy to reduce paper publication of certain documents. Staff were alerted by email. The intranet officer stated "the way you engage teachers is by making them have to go there." In relation to the school intranets he considered that schools would want flexibility and not wish to be dictated to in terms of content. He added "and perhaps one reason why we're not delivering local intranets to schools now is because we would have to deliver a specific framework." Schools "would prefer to create something, customize something for their own specific needs." The intranet officer admitted that this did mean that they were not providing a clear model for schools to look at and that they were rather "testing the water" with this. However he hoped schools would consider the model provided by the authority when planning their own intranets.

Authority C intended to provide the greatest amount of curricular support centrally to all schools via the authority intranet. They were the only authority providing instructional websites to schools on the authority intranet. The examples given by the intranet officer during a demonstration pertained to primary school use eg Maths quiz, language competition. The intranet officer stated that the authority was keen to develop more. He described these as "motivational" for pupils and was keen to point out how local schools

were encouraged to compete against each other. He was aware that some schools might develop their own instructional websites but felt that most teachers would not have the expertise yet to do so, hence the need to do this centrally. He stated that they could fund online subscriptions but the only example they currently provided was SCRAN. The intranet officer felt that schools would want the ability to subscribe to services themselves (eg one named school was subscribing to RM). Within the department responsible for the intranet there were a number of subject officers responsible for maintaining a list of websites. It was suggested that there could be confusion to pupils using the intranets in Authority C if information on curriculum related websites were available from the authority intranet and within subject department information in school sites (if schools chose to build their own lists). The officer was aware that schools would indeed want to keep their own lists but emphasized that the authority felt there was a responsibility for schools to share information. They encouraged schools to share resources by responding to the subject information held centrally on the authority intranet. This central collection of resources would also include careers information.

Authority B, with a fully managed service, received curricular support through the Web links created by the Managed Service Provider. They were not looking at building on these at authority level themselves. Schools would be expected to add to these on their own intranets. Modern Studies, Biology and Computing were mentioned as subjects which were working on developing curricular materials. Authority B talked of looking to purchase professionally made instructional web sites. There were a number of authority initiatives such as a group looking at a database for student profiling and reporting in schools.

Authority A had targeted training and development of ICT for subject specialists. Intranet officer A had recently started newsgroups for subject staff "to try and encourage them." It was hoped that they would eventually update materials relevant to their own subject area on the authority intranet. He felt that they were a few years away from developing instructional websites stating "very few people are used to using that type of electronic teaching methods." Online subscriptions were a low priority at the moment for Authority A due to lack of finance.

The provision of networked CD ROMs throughout the authorities was a confusing area. Intranet officer A described it as a "minefield" due to the cost and problems with software. They had experienced difficulties in networking some CDs despite claims that they were

suitable for networking. It was still an area they wanted to explore in particular for primary schools but not at the moment for secondary schools. Authority C similarly had not made a final decision but expected this to be an area for secondary schools to investigate themselves. Authority B through their Managed Service Provider were acquiring networked software and CD ROMs as each machine was being purchased. At the time of the interview six such CDs had been purchased for all schools.

Bulletin boards was another problematic area for the local education authorities. In Authority A these were only provided where it was a requirement for pupils coursework. They tended to block bulletin boards and chat rooms stating "We find it a very dangerous area." Authority B considered that they had a use eg for ICT officers. It was expected that they would expand these to become more subject oriented. Authority C stated that bulletin boards for ICT co-ordinators would be on the authority intranet. Bulletin boards for pupils would be within schools and would have to be moderated.

None of the authorities had made progress with video conferencing although they were aware that one or two schools had experimented with this. There were no major plans in any authorities to make this a central part of the intranets.

5.1.3 Communication

Staff in all three authorities had email. In Authority A it was thought that less than one third were using their email due to lack of access and lack of knowledge about how to use it. In Authority B many staff were not using email due to lack of access. Authority C were the most positive about staff take-up and talked of the many distribution lists that were in use. Given that there was more emphasis on communication in the purpose of their intranet then this was not surprising.

5.1.4 Ethical issues

The intranet officers highlighted a number of ethical issues which the authorities had to consider eg the possible identification of pupils via email addresses. Authority A was very concerned about use of pupil photographs and naming of pupils on both the intranet and Internet.

None of the authorities were at present considering putting staff information onto the intranets. Authority officer C said that staff were very concerned about their names

appearing anywhere on the web and he doubted whether staff records would be kept on either the authority intranet or the school intranets.

5.1.5 Access to the technology

The three authorities had very different strategies for access to computers. Authority A had taken the view that the head teachers in each school should have the say on “where, how and what” the computers were to be used for. Authority B were recommending the development of a number of laboratories of computers which could be accessed by classes. After this schools could decide whether to add more suites or where best computers should be placed. Authority C have followed a very different strategy by insisting that a computer must go into each classroom. It was expected that there should be suites of computers in each school but schools could equally add to the single computers in each classroom.

5.1.6. Key roles

There were differences between the authorities in the technical support given to schools. Authority A hoped to be able to place “network managers” in each secondary school. These would be staff on a technical scale. However they had yet to employ any of these technical staff and indicated that there could be difficulties as no one specifically trains IT staff for schools. Authority A had decided that due to cost they could not take the option of a fully Managed Service. Although more expensive Authority B considered that this was the only way to deal with the lack of available trained technical staff. It was felt that the Managed Service could deal with any problems in schools as quickly as any technician based in the school. Authority C had a technician support service and operated what they called ICTOs (ICT Officers). Each secondary school had an ICTO who was available to support the local primary schools.

ICT co-ordinators in Authority A dealt with referrals for technical issues and were expected to be involved in training. In Authority C the co-ordinators had initially been trained in trouble shooting matters and were expected to provide technical support for class teachers. However this role had now been taken over by the ICTOs and the ICT co-ordinators were to be more involved in curriculum development. Since the authority has a central training unit there is no compulsion on ICT co-ordinators to provide training. In Authority B the roles vary from school to school but due to the fully Managed Service they were not expected to be involved in technical support. They had been responsible for the twilight training sessions

run for staff in schools. In all authorities ICT co-ordinators had some responsibility for ICT planning.

5.1.7 Strategies for Innovation

Further questions were asked on the three main strategies for supporting the intranet discussed in the questionnaire, surveys, training and policies.

5.1.7.1 Training

Despite the NOF money the issue of training was seen to be costly to Authority A and B. In Authority A all training was out-with school time and this explained why the intranet officer felt it unlikely that all teachers would access the training. There was no compulsion to attend training. Before the NOF money had come into place Authority B had run their own twilight classes which two thirds of teachers had attended. Officer C in talking of training did not raise any issues of concern over finance or attendance. In that authority training could be done online in the teacher's own time though they also have a central unit.

5.1.7.2 Policies

All authorities had either provided or were in the process of providing operating procedures and policies on responsible use of the Internet/intranet and these included chat rooms, viruses and email. Only in Authority C was there currently advice available on creating web content.

5.1.7.3 Surveys

Authority A had undertaken a full hardware survey but no software survey. A development committee had included representatives from schools. It was clear from his interview and the school library officers interview that there had been a number of meetings for all staff to attend where they had been able to give their views. Intranet officer C agreed that it did appear that there had been little discussion with schools. There had been no hardware survey, or user survey as the authority had provided the new equipment as part of their strategy. Schools were required to keep internal audits of equipment. There was a group leading the development which included representatives from schools and headquarters.

Intranet officer B had said in the questionnaire that librarians were involved in the planning of intranets. Further questions on the extent of involvement were answered in terms of discussion with the public library service over a joint catalogue system. Steering groups had

initiated the intranet development but now they were using smaller groups which were more focused on curriculum development.

5.1.8 Authority involvement

Two of the intranet officers stated that it required the level of authority involvement to implement intranets in schools. This ensured all schools were given the same standards of equipment and brought schools to the same level of play. Officer B admitted that despite this some schools within the authority were racing ahead with developments and felt that this would always be the case.

5.1.9 Barriers

ICT training was non-compulsory. Intranet officer A stated that on the training courses they would get “the enthusiastic, probably the less enthusiastic and conscientious teachers. We’ll not get the ones who are either not interested or terrified of technology.” Authority A had already faced problems in dealing with teachers. The intranet officer stated “if we try to force it down people’s throats or too much too soon they just want to back away, can’t cope.” He talked of the increasing number of initiatives which were ongoing in Scottish education. Intranet development in his authority was seen as “just another one” of these initiatives. Intranet officer B stated of teachers “I don’t think they are using it. I don’t think they have the time to stop and take stock and do so.” Higher Still was still taking up much development time. “It’s a matter of just how much change can we cope with at once.” The intranet officer in Authority C was positive about teacher attitudes saying “even over the time I’ve been here, there’s been a huge shift in attitude and teachers are quite highly motivated now.”

For intranet officer B the main barrier to intranet development was access to computers.

Two intranet officers mentioned problems working with contractors who were unfamiliar with the educational field. Issues that they raised concerned understanding the diverse nature of education such as the harder rate of use on computers, and security issues when dealing with young people accessing information (Authority A). Contractors without a background in education were not always the most appropriate people to develop content (Authorities A and C).

The other main problem identified was in connection with the fabric of buildings and the need for adequate furniture. Water penetration (Authority A), asbestos (Authority A & B), additional fire requirements (Authority B) and lack of suitable furnishings (Authority A & B) had all to be tackled in the first instance. The finance for much of this had to be found within the authority. Intranet officer A stated "I don't think they (*the government*) fully understand the potential refurbishment problem that would be required within schools." This goes some way to explain why local education authorities have had to spend much of their efforts in concentrating on getting the infrastructure and basic building problems sorted. Intranet officer C did not raise infrastructure issues when asked about problems but it has to be said that they have invested the greatest amount of their own money into their intranet development.

5.1.10 Overlap of development

Intranet officer B raised the issue of duplication of work within schools. He stated that there was evidence of good work going on but it was up to teachers to make sure that others were aware of what they were doing. Authority A had targeted subject specialists as an "awareness raising" of intranet potential and to encourage internal authority development of curricular support. In discussing the SVTC intranet officer A mentioned problems of sharing resource materials, pointing out that many authorities have previously made money from selling curricular packs and were unwilling to share these for free. During the interview intranet officer C spoke of his role in coordinating developments within the authority and encouraging sharing. There was no mention of this as a problem area.

5.1.11 Discussion

The data from the findings of the authority interviews supported the questionnaire findings that there were low levels of involvement and discussion with schools in planning for intranets and they had not been provided with high levels of support for intranet development. The questionnaire findings had suggested that much of the responsibility for content would remain with individual schools. The authority interviews indicated that there was low expectation on schools to develop their own content.

Despite claims from two intranet officers that the intranets served curricular purposes (A & B), much of the material which these authorities have provided or were working towards providing, was of an administrative nature. These interviews highlighted that two of the potential curricular uses for the intranet suggested through the questionnaires, were problem

areas- bulletin boards and licensed CD ROMs. Will the curricular links and six networked CDs from the Managed Service Provider in Authority B be sufficient to encourage curricular use of their intranet? Training was targeted at authority subject specialists in Authority A yet it still appeared that individual schools were expected to develop content themselves. With low levels of training and lack of a fully implemented authority intranet to model their school intranets on, this might prove difficult. Intranet officer B suggested that some schools were already moving ahead despite being provided with the same infrastructure and support strategies (technicians, policies and training). This suggested that individual differences between schools will be very relevant and have to be investigated. Authority A implied that teacher attitudes to ICT through their willingness to participate in training was likely to be significant. Intranet officer A displayed characteristics associated with the technicist view, in that as a promoter of technology it was his duty to overcome the resistance and indifference to technology from teaching staff.

Authority C gave dissemination of information as the main purpose of their authority intranet- yet it is Authority C which appeared to be funding central curricular provision (instructional websites, downloaded curricular support, careers information). However this authority also was not supporting schools develop their own internal intranets with the decision to concentrate on the central authority intranet. Will this central authority driven intranet support the curricular needs of a school in the same way as an in-school intranet? Will there be the same need for an in-school intranet? What it ensured is that all schools in the authority have some support, despite individual differences.

The barriers given to intranet development were overwhelmingly those of physical problems in installing the intranets at early stages of implementation. These were the type of barriers associated with the technicist viewpoint. Intranet officer B provided access to computers as a barrier to use of the intranet. But if the authority policy placed computers in suites then there is likely to be less access for individual teachers.

One theme raised through these interviews was the idea of sharing of materials. Intranets invite the sharing of materials. There was a suggestion that sharing between authorities may be desired (eg on the SVTC) but difficult to achieve (Authority A). And sharing within an authority between schools may also be difficult if teachers do not let others know of their work (Authority B).

What we have in these interviews are two potential approaches to use and development of intranets. The purpose of the intranet appears to be influential to the development of the intranet within any one authority. In the first approach teaching and learning were the primary purpose (Authorities A & B). This purpose appeared to be linked to the question of access. With the curricular purpose there was more emphasis on keeping computers in laboratories. The consequence of this would appear to be that individual teachers may not have ready access to a computer and hence the intranet. Curricular subjects were targeted on the basis of those subjects which were most likely to benefit from the technology. The expectation was on external sources of curricular support through the Managed Service providing curricular web-links, through the SVTC, through centrally purchased CD ROMs or "professionally produced" instructional websites.

In the second approach there was greater emphasis on communication and administration as a priority (Authority C). Training in use of email was essential. There was a different approach to access to computers as one went into each classroom. Teachers required access to computers as they were expected to keep themselves informed of the work of the education department through the authority intranet. They needed access to a computer to participate in the training materials available on the authority intranet. Authority C had made curricular support a central issue by supplying links to web sites. Schools therefore had a starting point as they could use the authority intranet for curricular purposes. Teachers themselves were not expected to have the skills to develop their own materials.

5.2 Authority Interviews: Findings on the role of the school librarian

This section outlines the findings from interviews with the intranet development officers and school library officers on the role of the school librarian and intranets.

5.2.1 Planning for intranet development- A role for school librarians?

All those interviewed agreed that none of the School Library Services had been directly involved in the planning stage of authority intranet developments. In one authority there was direct involvement with the public libraries related to use of the catalogue on the authority intranet (Authority B). Yet five of those interviewed felt that school librarians had been represented indirectly through school visits and discussions with head teachers. Library officer C stated that there was no centralized coordinated focus with which they could be involved, and that informal discussions/involvement was typical of a number of initiatives relevant to school librarianship within the authority. She related the fact that school librarians training was ahead of teachers training to the authority having recognized that librarians had an important role. The authority policy of placing banks of computers in the SLRC, the new job descriptions with a high focus on ICT were given as further evidence of this. It was felt that even though they had not been specifically involved in the planning, the authority had recognized that school librarians were important to the development of intranets.

Library officer B stated that if working groups were to be set up at authority level after implementation then they would want school librarian representation alongside teachers. Only library officer A considered that the authority should have involved school librarians at the planning stage adding "I think in many cases the role of the school librarian has possibly been overlooked." This was related to evidence from meetings where librarians had shown that they "were the only people who were in any way positive about how this (*the intranet*) could be taken forward." At these meetings she stated it was obvious that many teachers were "incredibly negative" and that there was "considerable confusion" on how intranets are "going to work or for what purposes intranets are going to exist." Librarians "could see a positive application for the school intranet." This view reinforced comments from the intranet officer suggesting antagonism from teachers to the introduction of the intranet. Library officer A talked of an assistant director of IT who now appreciated that school librarians "are particularly enthusiastic" and recognised that "that's a good way in."

5.2.2 Resource Manager

All of those interviewed were happy to accept the role of resource manager for the school librarian. Library officer A gave the desire to put the library management system on the intranet as the “prime reason” to be involved with the school intranet. This would be a way of “extending, disseminating the information about the school library collections” (Library officer A) and would be a “natural extension” of their role. Intranet officer A talked of knowledge of sites and of where to go to search. He also mentioned limited supervision required for senior pupils using ICT. Intranet officer B said “The librarian is a resource manager. As a resource manager the librarian has to support staff, support pupils in research needs, has to advise them of support provision....has to monitor the work when they’re in that area.” Intranet officer C was much more hesitant on commenting on specifics of the role of the school librarian.

Links to public library catalogues via the intranet was mentioned by two library officers (B & C). Library officer C also referred to community access to technology in a growing number of schools. She mentioned the possibility of resources within the School Library Service, such as the off-air video database, being made available to all authority schools via the authority intranet.

Despite this acceptance of the role of resources manager there were a number of discrepancies in what might be included in the responsibility of the school librarian. One of these was with regard to CD ROMs. Intranet officers A and B did not relate these to the role of the school librarian. The intranet officers talked of central purchasing and networking throughout the authority. There was no mention of the involvement of School Library Services in purchasing, advising of appropriate CD ROMs or in promoting use within schools.

There was also some disparity between the interviewees when the interviewer attempted to relate the management of resources in the school library to resources throughout the whole school. As suggested in the literature review it is possible to make the library catalogue available in classrooms via the intranet and thus connect all the curricular resources of a school (Bell 1999). Although there was general agreement in the interviews on the need to co-ordinate resources within a school all were reticent to see the school librarian operating to this extent. Library officers saw this as some way in the future. Library officer A was sceptical due to the time commitment and lack of clerical assistance for school librarians.

Library officer C felt that for this to happen there would be a need to overcome teachers and heads of departments' desires to hold onto things. She felt that "school librarians would be enormously enthusiastic" and knew of one school where it was beginning to happen. Intranet officer A identified that there could be a role for the school librarian in "co-ordinating some of the access" but regarded it as an "onerous" task and suggested that tasks should be "manageable."

The role of the school librarian was extended from the organization and management of resources in the school library to communicating and advising staff and pupils of appropriate resources such as curriculum sites on the Internet. Library officer A talked of the librarian's role in "encouraging teachers to look in different areas for resources."

Library officer B talked generally of the technology opening up communication channels between the school librarian, staff and pupils, and of how librarians would find ways of using the intranet to support them in their jobs. Library officer C gave the example of using email on the intranet to allow for flexible time-tabling for the school library.

5.2.3 The technologist role

Evidence was sought on roles in managing technology throughout the school, roles in maintenance of technology, and in the development of websites (in particular instructional websites).

5.2.3.1 Network manager

All three library officers gave an initial positive response to the possibility of school librarians being involved in this way. Almost immediately library officers A and B then gave reasons for why this was unlikely to happen. Library officer A talked of the financial rewards which would have to be made for school librarians to take on such responsibility. Library officer B saw it as a huge task which would have consequences for the running of the library as they could not be both "network manager" and school librarian at the same time. The role of network manager was seen by this library officer as initially requiring a full-time post. Library officer C said that school librarians would want to be involved at some level in managing the network. Librarians should be involved in the policy side but perhaps not so much on the technical side of things. She also mentioned the role of the School Library Service and their responsibility to remind head teachers and schools of school librarians' potential.

Library officer A pointed out that it was difficult for school librarians to be the instigator of intranet developments in a school. Library officer B talked of the lack of confidence of some school librarians and the need to build-up that confidence. There was little evidence in the interviews of librarians playing a "lead" role. Network manager was not a role specified by any of the intranet officers. Of the intranet officers only officer A mentioned the role of school librarians in helping co-ordinate integrated policies in ICT. Intranet officer B stated "The librarian has a role on what is happening on machines in the library, but not out-with." Intranet officer C saw the librarian managing anything in electronic format "specific to the library."

Only intranet officer A felt that the school librarian could have a role in updating material on the intranet throughout the school, again depending on individual skills. However in his view it was more likely that departments would be responsible for their own areas. The response to copyright by all the intranet officers was that this was a whole school issue and would be the responsibility of the individual.

5.2.3.2 Web-page developer

All interviewed agreed that the school librarian with appropriate skills could have a role to play in developing web pages. Library officer A was hesitant about this stating that it was not known if any school librarians had the necessary skills at the moment. Library officer C knew of a number of school librarians within the authority already involved in developing their school web pages. Intranet officers limited their answers to relevant library pages. All three intranet officers made the point that staff in subject departments would also be providing subject web pages.

5.2.3.3 Involvement with instructional websites

Only one intranet officer and one library officer felt that school librarians could be involved with instructional websites. Library officer C agreed that it was a potential area of school librarian involvement, saying "very much so." Intranet officer B stated that it would depend on the way in which teachers worked. If they were used to working closely with the librarian, then there was the chance that the librarian might be involved, however it could just as well be another teacher. He added that it would also depend on the skills and "initiative" of the school librarian. Library officer A suggested that there may be a "lack of encouragement from the school management team who would not consider that to be a valid use of the school librarian's time currently."

5.2.3.4 Maintaining the technology

None of the intranet officers talked of this as a role for school librarians. All three library officers were aware that many school librarians carried out basic technical support within the SLRC. For some it's been out of "sheer necessity" (library officer C) because "they're the only person doing it" (library officer B). All three were agreed that this was not an area where they would want to see school librarians become further involved. "I don't think they would want to see themselves as a technician in any sense of the word" (library officer A).

5.2.4 The instructional role

The role of the school librarian was discussed with regard to instructing on use of the technology and information skills to pupils.

5.2.4.1 Instructing on use of the technology

It was accepted that the school librarian would be involved to a limited extent with instructing use of the technology. The intranet officers talked in terms of "helping" pupils and providing access to information sources rather than direct teaching of groups or classes. Library officer B pointed out that instructing in use of technology would also be carried out elsewhere in the school. Library officer C had a more prominent role for school librarians showing adults and community groups how to use the intranet and in some cases, training teachers. This role was related to the fact that the SLRC is an area of open access and the school librarian is in a position to "help."

5.2.4.2 Information skills instruction to pupils

All library officers recognized that school librarians had a role to play within school information skills programmes. Intranet officers A and C had not considered this as a role for school librarians although both agreed on the importance of information skills. Intranet officer B (a seconded head teacher) deemed this as the "teacher's role" stating that information skills should be taught across the school rather than through a specific skills programme: "The ultimate gain of ICT will be that it becomes part and parcel of what happens in the classroom" (intranet officer B). There is no argument that this is a preferred method, but further questions regarding what specific role there was for the school librarian in working with teachers on information skills saw answers which related only to making materials available to teachers.

5.2.5 Attitudes

Library officers were particularly positive about school librarians' attitudes to the intranet. They were described as being "positive" and "enthusiastic about the prospect of being involved in the school intranet" (library officer A); "Most of them are excited about the potential of how the intranet could develop" (library officer B). So important did school librarians view the intranet that it was considered that despite heavy workloads they would all set aside time for it "possibly at the expense of some other project" (library officer A). Library officer C gave the example of how one school librarian in her authority had "thrown" herself into intranet development because she believed that if she didn't do that "she would be forgotten." Intranet officer A's response to the question of the role of the school librarian was "It's not one that I've given a great deal of thought to" but added "it will vary from person to person." Intranet officer B in closing his interview spoke of the school librarian's role in connection to the intranet as "not more than another teacher."

5.2.6 Skills required

The views presented were that school librarians still required traditional "library skills" to organize the SLRC and maintain a catalogue. All interviewed talked of the necessity of school librarians to have relevant ICT skills. Current school librarians were considered to have good ICT skills. Library officer A talked of her school librarians as being experienced computer users, having used automated systems for some years. She later stated some training on the day-to-day administration of an intranet would be required for current school librarians. Yet she felt that rather than looking at the formal education of school librarians there needed to be a more structured approach to training once in post. Most school librarians in this authority are "fairly long established post-holders" and had acquired their ICT skills as they had gone along rather than through formal training.

Library officers B & C talked positively of the ICT skills of recent graduates entering school librarianship. Library officer B considered that "some school librarians are ahead of many people." Other skills identified were good communication skills, knowledge of teachers needs if advising staff, and time management skills.

Two of the library officers talked of the lack of educational knowledge which recent applicants for school library posts had displayed. The emphasis was on pupil management (library officer C), "the demands of a school librarian's job" (library officer B), the "jargon" of schools (library officer B) and a general educational background (library officer C).

Library officer B suggested that school librarians undergo placements in schools not dissimilar to the “crits” which teachers undergo. There was no implication that this desire for educational practice was new or related to concerns for managing increased ICT in the library. Library officer C mentioned that they have in the past requested that library schools pay more attention to training of school librarians but had been told that there was not the demand. This she considered meant that students “are not perceiving themselves as going to work within a school.”

5.2.7 Concerns raised

There were a variety of concerns raised during the interviews. Library officers mentioned workload issues relating to lack of clerical support (library officers A & B) and adequate ICT support (library officer C). Library officer A stated “if some of the more basic clerical tasks could be taken off their hands then they would be able to devote more time to ventures like that and I’m sure that they would be interested.” Library officer C was concerned that there be a balance between using ICT and traditional resources. This balance was also necessary with regard to finance and the SLRC schedule. For instance they would not wish to see a diminished information skills programme at the expense of too much time spent by the librarian on the intranet.

Library officer B stated “Not everyone is as welcoming of technological developments as others.” For some it was “scary” and they will get “stressed” by it. Library officer C said that the School Library Service had to recognize that “it is developing at different paces in different schools” and that “not all school librarians are at that stage yet.”

5.2.8 Discussion of authority interviews and the role of the school librarian

It is clear from this research that the library officers felt that school librarians had a positive role to play within intranet development in schools. There was no indication in the interviews with the intranet officers that they were aware of such levels of enthusiasm and interest from the school librarians. It could be argued that there was a negative attitude from them towards the role of school librarians. Although they considered the possibility of librarians being involved in some of the roles (eg web page creation, resource management, technology manager, technology instructor) it was only where it was specific to the SLRC. The SLRC was viewed as a separate entity within the school. Intranet officer B’s comment of “not more than another teacher” suggested a fear that school librarians were attempting to

create a greater role for themselves than they should. In contrast there was clearly a concern from the library officers that school librarians could easily be overlooked.

It is for more than self-preservation and personal interest that school librarians should be involved in intranet development. Library officer A talked of the confusion in that authority over the purpose of the intranet. Yet the intranet officer in that authority had given the primary reason for the intranet as learning and teaching. It appeared that teachers were not clear about how they could immediately benefit and relate to this purpose. Librarians on the other hand had a much closer link with another purpose of intranets- the dissemination of information. Librarians as information managers related to this and saw the potential of "extending, disseminating the information about the school library collections" (library officer A) as essential. Intranet officers gave this as a purpose of the intranet, agreed on the role of the librarian as resource manager yet at the same time provided limits to this role. There is no doubt that the scenario as suggested by Bell would be an onerous task for school librarians considering the workload (Bell 1999). However it could be argued that without such a central view of curricular resources, SLRCs will continue to be seen as an add-on, on the periphery of school life.

Despite the fact that they viewed the intranet as a way forward the library officers (and to a greater extent the intranet officers) saw the role only in terms of extending traditional roles. It was the resourcing role - managing the technology and access to resources within the library where they saw most change. There was limited evidence that they anticipated any change in role to extend within the technologist side such as managing any aspect of the technology throughout the school, in training, in managing whole school intranet content or creating instructional materials for the intranet. The key factor for the intranet officers was clearly the ICT skills of the school librarian. However they also emphasised the fact that teachers would be doing many of these roles themselves (so presumably would also require the same ICT skills). What they were not associating the role of school librarian with was that of information manager, with skills of information management relevant to an intranet. Intranet officers mentioned two other factors, the initiative of the individual librarians and the way that teachers work. There appeared to be an expectation that the librarian's role would be defined by characteristics associated with the individual librarian. The library officers on the other hand offered factors which mainly related to characteristics of the school - the clerical support in the library, time, senior management support, the views of teachers and policies of departments. There was less emphasis on the ICT skills of individual

school librarians, though some mention was made of attitudes. The main concern was lack of educational knowledge and awareness. This may have implications for school librarians if their involvement in the intranet necessitates taking a role in relation to policy decisions and in dealing with departments and their curricular needs.

School librarians themselves may not be surprised to find that authorities had not specifically involved School Library Services or school librarians in planning for intranets. Library officer C saw a clear role for the School Library Service in promoting the role of the librarian in their visits to schools (Authority C). Without this support it may be very difficult for some school librarians to become involved.

5.3 Progress with grounded theory

Before progressing to the interviews in schools it was important to consider what questions should be investigated within the schools and what themes had been identified to date.

In relation to intranet development, it appeared that the question of authority intranet compared to a school intranet needed further investigation. How important was it to have an authority intranet to model a school intranet on? The questionnaire and authority visits suggested that decision makers wanted schools to have flexibility in developing their own intranets. But what would this mean in practice for the schools? Did they have a clear idea of what they wanted to use their intranet for? The question of purpose of intranet appeared to be related to development and use of the intranet. It will be important to identify how the approaches as proposed at this stage relate to schools. There appeared to be no specific support strategies for schools. How then do schools develop intranets with such low levels of support? What are the issues which are important for development within the school? Are the physical barriers mentioned by the intranet officers still relevant or can further factors relating to individual differences or human relations be identified?

Where is the content for intranets to come from? Will schools subscribe to online resources, will they share materials, will they create content themselves? There appeared to be little expectation for this yet from the intranet officers. The focus appeared to be access to the Internet and email. There was little interest in bulletin boards and conferencing at this stage in intranet development. Will this be reflected in schools? Without content there may be a lack of take-up of the intranet.

Are individual school librarians in Scottish secondary schools stretching the boundaries of these different roles which have been discussed? Is the role of school librarians confined to managing the physical structure of the library rather than managing information? Are the factors identified by the authority officers important to understanding the situation in each school?

It would appear that as CD ROMs become "virtual" CDs over an authority's network and are seen as a whole school resource there is the possibility that librarians will not have such a dominant role in this area. Library officers appeared aware that the intranet had the potential of promoting the role of the school librarian. What these authority interviews indicated was that if school librarians did not seize this opportunity to get involved with the intranet then

there was a danger that some of the more traditional roles eg advising on CD ROM, on online resources, ICT related information skills, could be done within the classroom and that the role of the school librarian diminish. There were low expectations that the role of the school librarian would change.

These then were the issues that were significant at this stage of the research.

6 Findings: interviews in schools. The development of school intranets

This chapter provides the findings to the questions relating to the development of the school intranet. Schools are numbered in the order in which they participated in the research. The senior managers are referred to by their job title (eg head teacher). Quotes have been used to illuminate the findings. These have been taken from the analysis sheets provided by NUD.IST. Table 6 outlines the key characteristics of each individual school. Pupil numbers are included (School Government Publishing Company 2000). Each authority has been given an alphabetical code to allow comparison between schools in the same authority.

School	Roll	Notes
1	990	Large Town. Catholic. Leading technology school in Authority D.
2	670	Town. Leading technology school in Authority E.
3	850	City. Authority E.
4	820	Town. Authority E.
5	805	Town. Includes primary, 3-18 years. Intranet pilot for Authority F. Part time library assistant.
6	800	Town. Authority B.
7	1015	City. Catholic. Authority C. Access to Authority intranet. NOF training complete.
8	460	Town. Intranet pilot for Authority G.
9	640	Town. Authority B. Recent male graduate librarian.
10	1080	Large town. New Community School. Administrative intranet system. Authority H.
11	1456	City. Job-share librarians. Authority C. Access to Authority intranet. NOF training complete.
12	900	Town. One of the intranet pilots for Authority B. Recent male graduate librarian.
13	910	City. Catholic. Authority C. Older male librarian. Access to Authority intranet. NOF training complete.
14	650	Town. Authority I. Intranet to be withdrawn from school. Full-time library assistant. Completed NOF training.
15	1120	Town. Authority D. Longer serving male librarian. Technology leading school. Intranet in school for number of years.

Table 6. School characteristics

6.1 The intranet in schools

Schools 6, 9 and 12 used an intranet package from Research Machines whilst Schools 5 and 8 used a package from ICL. These provided a grid structure organised around subject areas for schools to adapt to their needs. Both packages provided curricular links to the Internet. These intranets came from authority decisions to purchase and not from individual schools. School 14 subscribed to Research Machines as an individual school. At the time of interview they still had the intranet package but would lose it within a few months when they moved over to the authority network solution. It would then be up to the school to decide whether to go ahead and build their own intranet. At this time their view was that they would concentrate on developing a quality website.

School 10 used an intranet package by BROMCOM which they had purchased themselves. The focus of this package was school administration, not curricular development. It was not clear whether BROMCOM could be expanded for curricular use within the school. The authority had provided the school with a network.

Schools 1, 2, 3 and 4 built their own intranets using the network structure within their schools. School 1 was networked as a new school seven years previous to the research interviews. The intranet followed soon afterwards and was available throughout the school. Schools 2, 3 and 4 have had many years experience of network systems and there was still evidence of previous separate systems being used by nominated staff (eg authority system by management). These schools were at different stages of intranet development. Schools could access the authority website where the school librarians have provided extensive curriculum support.

Schools from Authority C were included although it was recognised that individual school intranets could be at an early stage. This authority had a very developed education department intranet which was available in all the schools. It was this implementation which provided them with the technology to put together their own school intranets. The intranet officer had stated that each secondary school would need to purchase an extra server. The schools interviewed (7, 11 and 13) all had the required technology. School 7 had previously been running an intranet from the Computing department across the school using a Linux server. With the authority network technology and their own web server they had developed a new prototype intranet which was demonstrated. This intranet had not yet gone live to the

whole school. In School 13 the ICT co-ordinator stated "We have a basic framework set up but not put out to practice yet." School 11 had not put together an intranet though the technology for this had been in the school for almost two years. They were making use of email and the network for pupil and staff work. There were no further technical components required to put the intranet together. ICT co-ordinator 11 stated "we have got everything in place, it is just time, we have got the servers and we have got all the software." They accessed the authority intranet but like the other two schools did not contribute any extensive information to that intranet. The development of content for that came from headquarters.

The intranet as such obviously cannot be integrated into the teaching and learning of schools where it has not gone beyond a basic structure. Many of the respondents answered questions on the intranet in relation to the network and ICT generally. The intranet must be considered in this research in the broadest terms of what it can encompass.

6.1.1 Website via intranet

A number of schools were focusing on content for their websites ahead of intranets (Schools 10, 11, 12, 14). School 14 was the extreme of this, losing their current intranet. Their website had a section developed by the Physics department which included interactive elements, such as quizzes. ICT co-ordinator 14 argued against the need for an intranet stating that they would be keen to have pupil information pages, even using pupil contributors on their website. However that type of student area would be a "second stage" of use. The librarians in School 14 were less keen on website concentration as they felt that "there are a number of things that you would put on an intranet that you wouldn't put on a website."

School 11 talked of the website as a "major source of publicity" for the school and as a way of contacting parents. The money for the software to develop the website had come from the PTA.

There was evidence of schools preferring to use the website rather than the intranet for certain types of information such as pupil information, community information, school plans and policies which parents would want to see. Other schools preferred to concentrate firstly on the intranet. School 2 was at the stage where they were considering a website. Both the librarian and ICT co-ordinator mentioned sections of the intranet which could go out on the website (eg History subject guide). Head teacher 7 talked of the website being the next logical step after the intranet. The ICT co-ordinator stated "you dare not put something out

on a website until you have actually you know tested it.” Testing could be done through the intranet.

6.1.2 Home access

Although most schools were supportive of home access to the intranet it was generally seen as a long-term goal. Only School 9 was opposed to home access. Pupils had started to create a website which the head teacher had halted due to concerns of security and use of photographs. The head teacher had been supportive of the intranet due to the fact that it was within the school.

ICT co-ordinator 12 considered that eventually the authority would provide passwords to allow home access (there are templates on the RM intranet grid for homework) but in the meantime he was using the website for loading homework for his Computing pupils.

School 10 had the ability through their BROMCOM intranet to allow parents with a password to access the system and identify information on pupil attendance and class progress. However they had yet to fully investigate this capability.

6.2 Content on the intranet

An intranet model sheet (Appendix 2) was used as an aid to assess content and to prompt the interviewees into discussion. What appeared from discrepancies between some librarian and ICT co-ordinator answers is that individuals were not always clear on whether content was on the network or on the intranet. Therefore the data cannot be used as an accurate assessment of intranet content but it can provide a general guide which is helpful in making comparisons between schools.

School	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Current level of content	M	H	B	B	H	M	M	M	M	M	B	M/ H	B	M

Table 7. Levels of intranet content in participating schools

B= Basic. Schools made use of email, CD ROM, Internet access and network system. Limited structure eg home page and little more

M= Medium. Schools had a well defined intranet structure with a range of pages. Examples of content created specifically for the intranet was limited.

H = High. Content covered a large number of curricular departments and included some administration/ general content.

As can be seen from table 7, some school intranets had yet to develop any real content. What became clear was that schools were using their network and the security of staff/ pupil areas to maintain a range of pupil folders and administrative type content. For example many schools had placed copies of minutes and reports on the secured staff area within the network. Few schools had plans to transfer these into a format for the intranet.

6.2.1 Purpose of the intranet

Responses to this included "communication," "curricular" use and "dissemination of information." Evidence was sought in relation to the responses and patterns of actual use. No clear patterns emerged but those with more content were more likely to provide several uses for their intranet which included sub-categories such as a starting point for the Internet. Depute head 5 talked of a further purpose which they had "found." This he called "enhanced ethos" or "extra curricular dimension of the school." Librarian 2 also referred to such extra curricular material. Schools 11 and 13 gave purposes for the intranet which were not seen elsewhere: cutting back on paper, duplication and sharing of good practice.

6.2.2 Use of the intranet for management of the school

Clearly from such low levels of content it was impossible for the intranet to be used in aiding management of the school. Most senior managers did not view the intranet as a potential aid for management decisions eg head teacher 3 stated "The key thing for making decisions is discussion." ICT co-ordinator 1 talked of the benefit of email in keeping management informed. Depute head 2 commented on using the intranet to post position papers and get views back but could not see it used as the basis for policy decisions. ICT co-ordinator 9 similarly considered that it would be of value for staff consultation exercises. Head teacher 7 talked of the type of inspections reports from HMIs which he required. This he could find on the authority intranet. There was no evidence from those developing school intranet 7 that such management data would be included.

6.2.3 Administrative use

The commercial administration packages used by schools were installed by education authorities and were separate to the intranet. Only in Authority B (Schools 6, 9, 12) and Authority G (School 8) did the administration system run in tandem with the computers on the network (ie not part of the intranet itself but available to staff with the appropriate passwords on the same network). For example in School 12 it was possible to log onto any terminal and access SEEMIS the administration system. ICT co-ordinator 12 said the intranet would never be used for report cards or pupil reports as it simply was not secure enough.

Schools in Authority E talked of their desire to have the administration system available on the intranet. The network running PHOENIX, their administration system (the administrative network) was a totally different network to the one on which the intranet ran (the curricular network). School 2 considered that it was possible to connect the two systems, even with security as an issue. This would allow staff to access finance and timetables (School 3). At School 4, the ICT co-ordinator revealed a memo just received from the authority. It recommended investigation of integration of the curricular and administrative networks in schools. What was not clear was whether the data would go on the intranet itself.

In Authority C PHOENIX also ran on a separate system to the network that ran the intranet. There was no discussion of amalgamation in the schools visited (7, 11, 13). School 5 and School 14 in separate authorities ran different networks for administration to the curricular network with no plans to integrate. ICT co-ordinator 14 stated this would have to be an authority decision.

Only School 10 was running an administration intranet. The key feature for School 10 was the ability to register pupils each period of the day (they regarded the SEEMIS system as open to pupil abuse. BROMCOM in registering online each period was more accurate and allowed staff to follow up pupils who on a regular basis were late for classes). The school admitted that they had not fully explored the other administrative capabilities of the system (eg tracking pupil progress, encouraging pupil behaviour). The ICT co-ordinator raised concerns over the fact that the authority were looking at investing in a different administrative package. Because of authority requirements they were still required to add data to SEEMIS.

This helped clarify for the researcher problems mentioned in other schools. Despite using many of the functions in their authority administration packages, schools used a variety of other packages to meet their needs. Head teacher 7 stated "PHOENIX is not school administration with a nice wall round it." He talked of how PHOENIX has a timetabling function but in School 7 they preferred to use a separate timetabling package. Schools will always have to maintain these large administration packages to some extent for pupil records but have the ability to use other packages for internal requirements. It was some of these "other" requirements which were identified as potential administrative functions of the intranet, eg reporting and timetabling.

Report making and record keeping were key administration requirements which schools were spending a great deal of effort in finding solutions to. ICT co-ordinator 10 said "we are going round this circle of piecemeal development and I know of colleagues in other schools that are doing precisely the same thing." He added that much of this reporting development should have been done on an authority basis if not a national basis. Even within School 10, departments used different systems (eg some have developed their own methods using Clarisworks, others used Filemaker Pro). Similar views were given in Schools 1, 4, 8 and 13. Head teacher 1 had appointed a person for one and a half days per week to work on styles of reporting, linking that to learning outcomes. School 8 wanted assessment on the intranet simply to cut down the amount of paperwork for staff. Head teacher 13 viewed the ability to share departmental systems for monitoring pupils progress as a key argument for the intranet. She talked of departments learning from others and making use of exemplars and templates. But perhaps the data itself would not be on the intranet.

Suggestions of administrative data on the intranet included

- Timetables (Schools 7, 12, 13)
- Registers (School 13)
- Templates for development plans (School 9)
- Pupil referrals (School 13)
- Exam information (School 13)
- Booking system for pupil laptops and digital projectors (School 13)

Librarian 5 had started filling in the handbook section and general information for staff on their intranet grid. Schools 2 and 12 also had similar information available. ICT co-ordinator

7 talked of plans to include the handbook on their intranet but administration had been totally missed by the group developing the intranet.

No schools used the intranet for daily notices. School 2 had a news section but the daily news bulletin was not part of this. The librarian talked of it as being something “that we have highlighted” and that it would “make an awful lot more sense” to have on the intranet. In this school, administration staff used the authority network with no external email. Hence it was impossible for them to email the bulletins to the librarian. In School 4 it was found that the head teacher similarly used the authority email system and not the one in school. With the planned integration of school and authority network, this problem should be resolved. Librarian 9 had set up a page for maintaining the weekly school newsletter to pupils but had yet to put any newsletters on. ICT co-ordinators 3 and 13 planned to put daily notices on the intranet. ICT co-ordinator 7 had put a recent bulletin onto the prototype intranet which he was going to discuss with the intranet group. Not part of their plans, the ICT co-ordinator had put it on “to show them it is possible.” School 1 stated that staff were emailed all notices but that they still received their paper copy. Librarian 1 talked of a “reluctance” by some staff to give up the paper copy. In School 1 it was pointed out that minutes (in addition to the bulletin) usually go by email rather than on the intranet.

No school yet involved administration staff in discussions of intranet development although future involvement was mentioned in some (2, 5, 13, 14).

The staff shared areas on networks enabled staff to access a range of administrative documents (eg School 14 the presence of the staff shared area on the network was a reason for the intranet not being seen as a priority). Depute head 5 was aware of the potential of the intranet for administration and put this down to priorities. They had wanted to use the intranet for curricular use as a first stage. Librarian 5 (intranet editor) had not pushed for administration due to increased work which would be incurred. School 13 gave staff access as a problem which had to be overcome before increasing the administration on the intranet.

In discussing administration, librarian 3 indicated that the attitude of teaching staff was a problem with some staff not wanting anything to do with the intranet.

6.2.4 Communication on the intranet

This could be seen as part of network use and not specific to an intranet. However there are a number of points which appear to be significant in looking at overall development of the intranet.

6.2.4.1 Email

Only in Schools 1 and 2 was there strong confidence in the use of email. Assistant head 12 stated “every staff member has an email address but if I was wanting to contact a wide range of people I would still put a memo in the pigeon hole because I only manage to check my email once a day and I would imagine that quite a lot of staff would check it even less.” This was typical of a number of schools.

Low use of email was blamed on:

- Teachers not having access to a computer in the classroom (most frequent complaint)
- Lack of opportunity to check email- eg staff commented on checking first thing in the morning before notices had been sent.
- Staff attitude
- Two email systems operating in Schools 2, 3 and 4. Senior managers and office staff were on a different system to the rest of the school.

Despite the separate systems in School 2, the ICT co-ordinator 2 stated that 90% of staff were in regular contact by email. Schools 3 and 4 in contrast had very low email use. In a number of schools it was evident that Computing, Business Education, Technical departments and the librarian were the main users of email. Librarian 7 indicated that she could contact librarians in other schools but could not rely on it for contacting staff in her own school. In almost all schools staff had been shown how to use the email system.

School 1 appears exceptional with the head teacher stating “literally within days 95% of staff communicated with email and that has continued.” This school was slightly different in that the network was part of the new school building and all staff came to the school as a fresh start. It was clear that the email system had become part of their daily routine with loss of the system causing great inconvenience to the “efficiency” and quality of service. Mention was made specifically of guidance staff who by the nature of their work regularly contacted a range of teachers concerning individual pupils.

6.2.4.2 Bulletin boards/chat rooms

Most schools were not making use of these. Reasons given were

- Not a priority
- Teachers were unsure of the value

Exceptions: School 12 used Netmeeting, a discussion forum with S1 and primary school pupils when they arrived in secondary school. School 14 gave a positive reaction and were considering future use. Librarian 5 was aware that Computing make use of Bulletin boards for pupils but felt that it was not something he would encourage in the library nor want on the intranet.

6.2.4.3 Video conferencing

In no school was this relevant to the intranet. Schools which had video conferencing, had it as separate to the network. There was scepticism and mention of video conferencing as a “gimmick”(ICT 7).

6.2.5 Curriculum support resources on the intranet

These ranged from basic curriculum support where standard worksheets were available, to the Internet links provided by the intranet providers, the school librarians or planned by the ICT co-ordinators, to specifically developed in-school instructional websites linked to Internet resources. Integrated learning systems were mentioned in a number of schools (eg Successmaker and Keybites in 6, 8, 9, 10, 12) but available on networks not the intranet.

6.2.5.1 Curriculum support pages

(See also section 7.2 for what librarians are providing)

School 1 has had an intranet for many years and although teachers made use of the Internet and email, only Computing appeared to provide worksheets on the intranet. This was also found in Schools 4 and 12. In School 13 the intranet prototype only had curriculum related websites related to the Drama department to which the ICT co-ordinator belonged. Schools 6, 9 and 12 had templates provided by RM where each department had a section with links to external sites. Librarian 12 was unsure how up-to-date departmental links were and considered that few had subject support information for pupils. In School 9 the librarian stated of teaching staff and their grid “They are using it but they are not tailoring it to themselves.” The ICT co-ordinators in Schools 6, 7, 12 and 13 all talked of working towards developing more departmental pages (with pupil help). ICT co-ordinator 12 talked of

encouraging staff to use revision sites such as Bitesize and NGfL sites relevant to their subject areas.

Schools 2 and 5 had a range of curriculum support pages with worksheets and pages with URL links for most departments.

A number of schools emphasised the intranet as a tool for supporting flexible and distance learning (1, 2, 3, 4, 13) and of future developments in this area. Head teacher 1 talked of forty flexible learning packages, commissioned by the Scottish Office for schools. There was an expectation that materials to support flexible or distance learning would be created centrally.

6.2.5.2 Instructional web pages

(See section 7.4.6 for what librarians 2, 5 and 15 are providing)

There was a mixed response from senior managers and from ICT co-ordinators on instructional websites. A number of schools indicated that they had either purchased or intended to point to known instructional websites on the Internet (Schools 2, 7, 8).

A few schools had examples of instructional websites created within their own school:

School 14- Physics interactive website on the Internet had received a positive reaction from the HMI.

School 12- Computing had created instructional websites on using HTML and Java.

In School 13 the ICT co-ordinator was keen to develop his own instructional website to put on the intranet as an example to other teachers. ICT co-ordinator 7 was also positive about teachers' future involvement. He considered that teachers were not far off being ready to use PowerPoint as an instructional lesson tool on the intranet.

The main barriers mentioned were

- Lack of teachers skills
- The need for quality content, seen as more likely to come from external sources
- Lack of time eg ICT co-ordinator 12 "We haven't time to do that. In the real world that is not going to happen."

6.2.6 Technology support pages and training pages

Three schools had information pages for supporting staff and pupils with the technology on their intranets (2, 5, 12). In School 2 it covered information on IGEAR use and help pages on searching the Internet. School 12 called it “network notices.” The ICT co-ordinator stated it was an idea they had “pinched” from another school. It contained information on recent virus alerts, general information on computer use (eg shut down computers at end of day) and what to do if your printer jams. They were looking at expanding these pages.

School 2 provided training notes on their intranet whilst in School 12 there were training packages for staff. Schools 7, 11 and 13 could access training material on the authority intranet.

6.2.7 Extra curricular content

In School 2 a PowerPoint presentation of the school show was available on the intranet and was popular viewing in the school entrance hall. The ICT co-ordinator added that now “everybody wants to get in on this.” There were many examples of pupils work on display with the librarian commenting on pupils rushing to the library to see what was new. Librarian 2 stated how previously it was a case of putting on photographs, but now the desire was for a PowerPoint display. Librarian 5 commented on how pupils “love to see their own work.” Librarian 12 has added data on the school archives.

ICT co-ordinator 7 demonstrated the prototype intranet with the headings of Faith, Festivals Creativity and Celebrations. Information on Feast days and Awards ceremonies could be found under Celebrations (which then led to information on sponsors). Creativity was designed for pupil display of literacy, art work and drama. Elsewhere there was a section on clubs, such as the hill walking club but a lack of content.

6.3 Roles

Individual responsibilities in relation to the intranet will now be discussed followed by an outline of the ICT co-ordinator and senior managers roles and how these connect with the intranet.

6.3.1 Responsibility for managing the intranet, updating and uploading material

In Schools 2, 3, 5 and 9 this was a role expected of school librarians. In the other schools it was generally the ICT co-ordinator who was responsible for managing and uploading the material on the intranet (other members of Computing and ICT technicians may have some responsibility). There is some difference in the generating of materials and up-dating of materials. Some schools intend to use pupils (6, 7, 12), others an ICT group (8, 11) and School 13 both. In Schools 1, 3 and 10 there was a dispersed model with individual departments expected to provide content for their own sections, passing it onto the Computing department to upload.

The people who talked of using pupils were all ICT co-ordinators eg ICT co-ordinator 12 stated "It is mainly groups of pupils who will go out into the department and invite departments to make a submission." The reason behind the pupil use was that they have to create web pages as part of Higher Computing and this would provide them with practical skills, at the same time saving the ICT co-ordinator from doing the work himself. ICT co-ordinator 12 stated "that is a skill that they undertake and they love it." ICT co-ordinator 7 had previously used his Higher Computing class when they ran their Linux intranet. ICT co-ordinator 6 stated "pupils are going to be giving me revision websites, curriculum based websites, interest based websites."

School 2 had made use of a pupil on work experience to create information pages for the intranet. School 5 had previously made use of pupils for gathering the information, however the librarian stated that it had not worked as the pupils had not been committed enough. (When librarian 15 was interviewed for the role of the librarian question, it was found that the original scheme of pupil developers was abandoned after similar difficulties arose).

In School 14 teachers had put forward a case for not spending time creating web content. Although School 14 is getting rid of the intranet they will require web content for their Internet site. They have just appointed a new technician with design skills who will create materials for the teachers. Office staff may also update content. School 13 also intends using office staff to update, but are keen to use the intranet for administration.

In Schools 2 and 5 the librarians created most of the content (see 7.4.5).

6.3.2 Copyright responsibility

ICT co-ordinators considered that they were responsible for copyright. Although they were confident in talking of checking copyright of software licenses, there was less confidence in discussion on their responsibility for use of graphics and images on the intranet. For example ICT co-ordinator 13 stated "I think it would be heads of departments" but that he would give advice whilst ICT co-ordinator 12 saw this as the responsibility of individual teachers.

Only School 1 provided evidence that they had tackled copyright issues, with the ICT co-ordinator and a Computing teacher addressing this through in-service training to all staff.

6.3.3 Role of ICT Co-ordinator in relation to the intranet

Assessing the role of the ICT co-ordinator was not easy as they varied across schools with differences in the remit, the amount of time for the role and other staff within the school who undertook similar tasks. Specific details of the ICT co-ordinators role can be found in Appendix 12. The main findings were as follows.

A number of schools have appointed a member of senior management as their ICT co-ordinator (3, 4, 8, 10, 14). In none of these was there anyone specifically in charge of the intranet and it became clear that many of these senior managers lacked time and real expertise to be able to promote the intranet. School 5 had no ICT co-ordinator as such but a member of senior management with ICT in his remit and the school librarian as intranet editor. Similarly in School 2 a senior manager was responsible for ICT, with no ICT co-ordinator. There was however a senior teacher for ICT (Physics) who was responsible for creating the first intranet before the school librarian re-built it and took over the management. Other schools generally had a senior manager who had policy responsibility for ICT alongside a teacher as ICT co-ordinator who had a range of responsibilities which included the intranet. The amount of time given to teachers as ICT co-ordinators varied from a half day to two and a half days per week. The time given did not indicate whether the intranet was further developed eg ICT co-ordinator 11 had two and a half days but he was in a large school with many responsibilities and talked of the intranet as a low priority.

6.3.4 Senior management

Questions were asked with regard to senior management support of the intranet. There were several negative responses from school librarians. Librarian 3 was critical of her head teacher stating "He hasn't really any idea of what's going on." The head teacher appeared generally positive of ICT but stated "...for me speaking personally the best communication I have is that open door, is folk walking in and I wouldn't want to lose that." Head teacher 10 began his interview by stating "I am slightly more interested in the role of the librarian than the development of the intranet." He and the ICT co-ordinator both felt they were generally supportive of the intranet but gave little indication of looking to extend their administration intranet to include curricular materials. The librarian did not consider them to be supportive. ICT co-ordinator 9's response to senior management support was "yes if they knew what it was." Librarian 12 felt the senior management would be supportive when they saw the benefit. For librarian 4 the support appeared to have been there in principle but not in practice "The idea yes but nobody has done anything about it."

Librarian 5 was also critical. He had suggested to the head teacher that he write something for the intranet. The head teacher had asked him what he should write and then told the librarian just to put up those suggestions. The depute head stated that one of the librarian's criticisms "would be that the senior management team has not taken it by the scruff of the neck and done all they can with it. And to that extent he is a 100% right." He felt that within the senior management team there was varying degrees of awareness about what ICT could do and that perhaps it was not a negative response or obstructive reaction but lack of knowledge. Drive from management had not been a factor in intranet development but he stated they were "very keen to support it."

The rest of the schools were generally more positive about senior management support. In their responses they discussed a number of ways of displaying this support.

6.3.4.1 Raising awareness/encouragement

Head teacher 11 stated "We have to raise awareness, show people what is possible, whet their appetite." Head teachers 1, 4 and 7 gave similar views. In School 7 senior managers were on the intranet group. Head teacher 13 felt that her presence on the Authority Strategy Committee for ICT and the School ICT Committee highlighted the importance of ICT to staff. Head teacher 1 displayed evidence of conviction and drive for the intranet. When the school was being built he had argued for a network system stating "I wanted it in" despite

“big resistance” from the Council and architects. Previous experience, through being a national advisor to TVEI had persuaded him of the value of this. ICT co-ordinator 1 felt that some of the other senior managers could do more and stated “They don’t make as much use of it as they could. Not in their management, not in their teaching.”

6.3.4.2 Appointing key people/or ICT Group

A number of senior managers mentioned specific appointments of ICT co-ordinators as significant. In two cases the ICT co-ordinators had been given a place in the senior management team (9, 12). Head teacher 11 focussed on the role of the ICT group in being proactive in developing the intranet. There was no evidence to support this from the others interviewed in the school.

6.3.4.3 Funding

The role of senior management in providing funding was mentioned in Schools 1, 3, 4 and 7. For example head teacher 1 provided finance for the wireless computers and School 2 funded a library auxiliary (several months after the interview).

6.4 The technology

Access to computers was a key issue discussed in the interviews. Schools had different views on how best to achieve this.

6.4.1 Access to a computer in each classroom

Schools 7, 11, 13 (Authority C) and Schools 2, 5, 8 and 14 all attempted a minimum of one computer per classroom. In Authority C it was a decision taken by the authority. Head teacher 13 said “you need at least one computer in every classroom.” Librarian 7 pointed out that it is not just having the computer “you have got to get that lined up with people using it and getting used to using it.” Depute head 2 did not agree with the model of suites describing the use of these as “artificial” and not an “integral part of their teaching and learning.” He hoped that within 6 months many classrooms would have two or three computers. In contrast ICT co-ordinator 13 stated of the policy “I think it works much better in primary schools.” The schools in Authority C all made reference to practical difficulties of having a computer in each classroom eg inadequate furniture, lack of space.

6.4.2 Access to suites

All other schools focused on building suites, normally of around 20 computers. These were generally aimed at Computing, Business Studies and Craft and Design, with the SLRC often

considered as an extra resource. Priority was given to these departments but some allowed flexible booking of at least one suite in the school. ICT co-ordinator 12 argued strongly against putting computers in each class stating “No way, no, no...That wouldn’t work. No the suites are the way forward.” School 4 and 10 permitted departments to pool their computers for pupil use eg in Science. School 6 had two general suites and were considering putting future machines into classrooms.

What became clear was that neither of the above two strategies had clear benefits for the development of the intranet.

6.4.3 Methods of increasing access

A number of schools were looking at ways of increasing access to computers. School 3 and 13 talked of investing in Smartboards (these allowed teachers to demonstrate on a large screen as pupils worked). Schools 8,11 and 13 were investing in LCD projectors. School 1 had opted to test eight wireless computers (I-books) to use as a “mobile flexible facility.”

Although the above have obvious benefits for ICT and teaching and learning, they were not key issues in the schools leading development of intranets.

6.4.4 Technical Problems and technology support

A wide range of technical issues was mentioned in relation to the intranet (Appendix 13). But despite the diversity of complaints no significant patterns emerged and there was little evidence that this was a major factor holding back intranet development.

The presence of an in-school ICT technician was dependent on the authority strategy. Schools varied in levels of technician support (Appendix 14). Despite lack of technician support being a major complaint and a “desperate” need in one instance, there was little evidence that their presence had a positive effect on intranet development itself. ICT co-ordinators felt that more in-school technical support would free them to spend time on the intranet eg 1, 13. But this was not shown where schools had more technical support, nor did it always occur in schools where intranets were operating well. School 14 by choosing to employ a technician with web creation skills could potentially have seen a difference on their intranet pages if they had carried on with their intranet.

6.5 Development of the intranet

A range of potential strategies and factors in development of intranets were identified.

6.5.1 Pilot schools

Three schools were piloting the intranet for their authorities (5, 8, 12). Only in School 5 was this seen to have a direct effect on intranet development. A group was set up to look at the intranet. The librarian was then nominated as "intranet editor" with the task of setting up and populating the intranet. The library assistant was given funding to allow for extra hours to add content. They had been provided with training and support from an authority officer and from ICL. But there did not appear to have been pressure on the senior management to push the intranet, on the school to develop the intranet in a certain way nor to report back in a structured manner. The intranet was not yet available in other schools in this authority.

School 8 was named by the authority as a pilot. The school was vague about what this entailed.

ICT co-ordinator 12 stated that they had piloted the intranet in terms of the technology. They had been chosen because they were an old sprawling school which would test the infrastructure. Although School 12 was working on content they were not reporting back to authority level in any significant way. All schools in that authority now have intranet technology installed. ICT co-ordinator 12 felt that there was a move "towards looking at the curriculum, the innovation side of it."

There was a lack of mention of pilot schools in response to the question on local authority strategies. Only School 10 referred to other pilot schools in the authority. When questioned these appeared to relate to technical issues rather than providing a model with any strategies to support it. The head teacher stated that what the authority has provided has been a slow process.

6.5.2 Technology leading schools

Three schools described themselves as technology leading schools (1, 2, 14). Schools 1 and 14 had had very similar experiences in that they had been leading edge but had come to a standstill when the authority went ahead with their own plans for networking. In both cases it has meant the schools abandoning their own solution and moving in-line with the authority

system. School 1 felt that their development suffered with head teacher 1 stating "it has been difficult for us to actually make a good deal of sense in terms of our forward planning."

School 2 had had a network for 6 years. Three years ago the authority provided ethernet cabling and gave them the potential to develop their own intranet. However it was only in the previous year that they considered that they had become a leading technology school. Mention was made of positive HMI reports on technology use. The librarian reported that involvement in ICT had raised morale in the school and stated "I think it has given the kids a bit more confidence." The deputy head stated "we are integrating it more into what happens in the classroom" and considered staff attitude to have made the "biggest difference." Librarian 2 stated that "without realising it, they are now wanting to create something more from it."

Although deputy head 5 did not regard themselves as a leading technology school he was aware that due to the pilot they now had a high involvement in ICT. He also emphasised that this was a recent development. He talked of the "receptiveness of our own staff" to the intranet and ICT.

A number of other schools indicated a range of experience in relation to ICT without regarding themselves as leading edge. The Computing departments in Schools 7 and 12 had run their own small intranets. Schools 1, 7 and 14 mentioned visiting other schools to view intranets. ICT co-ordinator 1 had been in contact with schools in Australia when they had started. They identified one other leading school in their authority (which became School 15). School 8 had been involved in a number of ICT projects for the authority (video conferencing, Internet and LCDs). School 10 also talked of involvement in video conferencing projects.

Schools 2, 3, and 4 have had many years experience with the use of a network and email through their authority network. Schools 1 and 8 have also had many years of experience using a network. In all other schools the network and intranets have only been introduced within the previous three years.

6.5.3 Working parties/ groups/ IT committees

Only two schools had a group specifically set up to help develop the intranet. The intranet group in School 5 was intended to kickstart their pilot. The first meetings of these had concentrated on dividing up the roles in relation to the intranet. They also discussed general areas of the intranet they might populate (ie add data). However the group had failed to meet since and have had little to do with any ongoing intranet development. The depute head did not consider the group to have been a major factor in intranet development adding "It perhaps primed it a wee bit to initially get it going."

In School 7 a recently formed group was led by the assistant head as "editor." The group had been given training in HTML, but the ICT co-ordinator was sceptical of the value of this: "The idea is that they would become experts so that everything is of a certain standard." He himself talked of not being on the group as "I felt if I got involved they would be maybe reluctant and hesitant." He has taken on the technical role and put their plans into action. There is contention between the group and the ICT co-ordinator. The ICT co-ordinator referred to the structure of the intranet as "parochial" ie it reflected the views of the working group but not the whole school. It was not obvious where to find information on a number of subject departments including the SLRC. The head teacher was aware of this dispute and considered that there was value in taking time to discuss and debate the intranet. An email sent to the librarian a year on indicated that the intranet had not made progress.

All other schools had ICT groups. It was clear that few acted as drivers for the intranet. Meetings were ad hoc (4, 10), infrequent (6, 11, 13) or the group had not met recently (12). Head teacher 11 considered the school had to be "proactive" and hence had set up an ICT group. There had been one meeting which had highlighted questions to be addressed (ICT policy, training needs and access to computers). There was little discussion of the intranet. ICT groups had worked on developing general ICT policies (9, 11, 14), access to technology (1, 2, 9, 11, 14), roles in relation to ICT (2), information skills (9) and website development (8, 14).

Only in School 1 did the ICT group appear to be actively involved in a range of ICT issues which could be seen to have had an immediate effect on the use of ICT in school. In the six months since it was set up they held four meetings discussing access to computers, funding for a mobile classroom and increased use of CD ROMs through involvement in the Pedactus Project. But again there was no direct discussion or action specific to the intranet itself.

6.5.4 Individuals and small groups

Three schools indicated that the real ICT development came from smaller groups of individuals (eg School 1- Computing department; School 2- ICT co-ordinator and librarian; School 4- PT Business Studies, PT Technology, ICT co-ordinator and librarian; School 13- ICT co-ordinator, head of Business, Computing and CDT). ICT co-ordinator 2 stated of the intranet "We have the ICT group but it really has been thrashed out by *the librarian* and I and it is kind of private but listening to...but we are very much trying to supply what people have asked for in the school." Depute head 5 was quite specific that the librarian was the only person leading the intranet there.

One of the outcomes of the IT committee in School 1 was a recognition that many staff in the school had expertise in different areas of ICT. They had asked people to put forward their own expertise and disseminate this to the rest of the staff. The librarian talked of this system of support as being "less intimidating." Librarian 2 had similarly talked of directing people to experts in different software around the school.

6.5.5 Policy documents

No school had a specific document in relation to the intranet. Schools had policies/guidelines in relation to use of ICT (typically covering use of email, the Internet, booking procedures, fault reporting). Only School 5 gave evidence that they were preparing information specifically on the intranet. A report given to the researcher stated that the SLRC was to prepare a handout on the nature of the intranet with navigation details for users.

A number of schools mentioned that the intranet was covered in their development plans (Schools 1, 2, 3, 7 and 8). In School 1 it stated that staff are encouraged to make use of the intranet. But as ICT co-ordinator 1 pointed out, teachers don't sit down with their lesson plans and say because it is in the development plan we must incorporate the intranet into our lessons. This general mention of the intranet in the development plans appeared to be typical. Depute head 8 was more specific. In addition to encouraging greater use, two other aims from the development plan were encouragement of pupil involvement and to investigate assessment through the intranet.

The librarians appeared more critical of lack of planning within schools than other staff. Librarian 3 talked of the necessity of having these plans "conveyed to staff." Librarian 10 talked of "a lack of cohesive structure where a procedure could be formulated."

As the questionnaires had suggested there were few policies or guidelines from authorities to help with the development of the intranet. Most authorities had what could be described as codes of practice or ICT guidelines. For example School 12 could refer to guidelines and exemplar policies on ICT and acceptable use documents. As ICT co-ordinator 13 pointed out these policies were non-specific with regards to the intranet stating "a lot of the information that comes from the authority is pretty vague." ICT co-ordinator 6 similarly mentioned their draft policy on ICT "but within that there is not a great mention of the use of the intranet." Librarian 5 referred to the absence of policies as "like getting blood out of a stone." The main criticisms of authorities were lack of direction on what to do with the intranet and the need for better communication. Depute head 2 talked of "No steer from the centre" and felt that there was no effective leadership on how to develop the intranet to improve teaching and learning. He stated that schools "will always have to do it for themselves to an extent but I think personally we need more guidance." Librarian 5 would have liked "guidance as to what they want done with it." He considered that his role should be more formalized within the school and also within the authority. This was surprising in that out of all the schools in this research, he was the only one who had been given a formal title. As a pilot school he worked with the authority ICT officer and had a formal role providing feedback to headquarters. However it was also clear that he was left to develop the intranet on his own. He did go on to say that it suited him as he was able to do his "own thing." ICT co-ordinator 10 in talking of authority support stated "there is an element of the intranet is a good thing but a lack of definition in precisely how to make it a good thing." ICT co-ordinator 6 suggested that it could have been done as an authority standard but "it has been left to schools themselves to develop their own intranet."

6.5.6 Ad hoc development

Intranet development in School 1 was described as "ad hoc." The ICT co-ordinator stated "Someone has an idea and yeh we can run with that...We just keep pushing it forward." Depute head 2 said we "show staff the benefits and then let them run with it." The librarian described the development as "a complete hotchpotch." In School 5 the librarian referred to how the intranet had not gone live when he arrived. He felt that to wait until the grid was completely filled was an endless task whereas to "go live and fill it up as we go" would at least get them started. They had policy concerns but found less problems had appeared than they anticipated. In School 9 the librarian had started to "personalise" the templates. He stated "Once you regularly check the intranet because there is information up there that is worthwhile and useful then it will actually encourage people to put up pages of links."

In School 12 the ICT co-ordinator saw the intranet as developing by example and use "we do not actually go out to departments and say to them what are you using this intranet for...I think examples of good practice are necessary and have been used already to spark ideas in people's heads."

6.5.7 Priorities

Four schools stated that the intranet was not a priority (4, 8, 11, 14), eg ICT co-ordinator 11 "The intranet has a low priority but the networking and the access of files has a very high priority." This was surprising from School 8, a pilot school. Librarian 4 found it frustrating saying "It just sort of vaguely, yes it will happen" but it was not being discussed in detail and it was not being pushed. For School 14 the intranet had been a priority when there had been poor access to the Internet (eg in downloading a site for class use from the Internet onto the intranet). The new network with a more reliable service to the Internet has meant that this was no longer an argument for justifying an intranet.

6.5.8 Time

This was one of the main complaints by schools in being questioned on intranet development eg ICT 11 "basically time, time is a major factor in everything we do." ICT co-ordinator 3 talked of staff "having their backs to the wall" and felt they couldn't really have pushed much further. Librarian 11 stated there was willingness but nobody seemed to have time.

Specific examples related to time to plan for the intranet, to consult (librarian 3, head teacher 4, ICT co-ordinator 11), share experiences and good practice (head teachers 3 & 4, assistant head 14). ICT co-ordinators 2, 7, 13 and librarian 9 mentioned issues of time relating to the setting up of the intranet. Training, with the need for building confidence and investigating software was mentioned in a range of interviews (School 1, head teacher 4, ICT co-ordinator 4, librarian 8, and ICT co-ordinator 12). Time was also seen as necessary for developing content (depute head 5 and assistant head 8).

6.5.9 Staff knowledge

At the heart of School 7's dispute over their creatively designed intranet appeared to be teacher understanding of what the intranet was for. The designers had concentrated on the look and feel of the intranet whilst the ICT co-ordinator was more concerned about the quality of information, access routes and lack of interactivity.

This concern over lack of knowledge was evident in a number of other schools. Librarian 1 stated there was a “lack of knowledge of what we could use the intranet for.” This was repeated by librarians 4 and 5, and ICT co-ordinators 7, 9 and 11. Librarian 5 said of his school staff and the intranet “they just do not know what it is about.” In addition ICT co-ordinator 9 talked of “resentment” amongst staff that so much money was being spent on ICT. Librarian 3 stated that there was a problem “persuading people that it is really necessary, that it has a need.”

ICT 14 speaking from his experience as a former Computing Advisor admitted that the integration of ICT was obvious to a “minority” of teachers and that staff needed to be “made aware of the possibilities.” He talked of “new tricks” and gave the example of revision sites as quite a revelation to teachers. ICT co-ordinator 7 suggested that once lessons were available on the intranet it would “spark things off.” He talked in terms of a snowball effect. Head teacher 13 considered that “far more good practice has to be shared.” Head teacher 7 stated that sharing of good practice has always been a problem. When questioned further he did not consider a reluctance to share, just that teachers tended to be modest. ICT co-ordinator 3 talked of the intranet evolving, “if people see that it has spin-off, that it has an end to it then they will certainly use it.”

Schools 7 and 14 both commented on the young teaching staff as significant in the uptake of ICT in their schools.

6.5.10 In-school developed curriculum content on the intranet

Librarian 2 provided examples of work with a range of departments and plans for further departmental use of the intranet. Depute head 2 considered that what they were providing “can only enhance what is happening” with the Scottish curriculum. Librarians 5 and 9 by setting up the intranet sections for all departments and by attempting to supply curriculum links for all departments ensured that the intranet was seen as a whole school tool. Depute head 5 considered the evaluated websites evidence of integration of the intranet stating “it cuts down an awful lot of time for pupils to get to what it is they are after.” Teachers saw the potential of it in the classroom. He referred to the importance of this for the information cycle. However he considered that different departments were at different stages depending on ICT competence and confidence. The librarian reiterated the positive view of the web support saying that the biggest difference the intranet had made was in the way pupils get their information and getting it at the right level. He talked of it as a “shepherding tool.”

Depute head 5 talked of how the intranet and the curriculum “can only be a good thing... we are doing a lot of the populating of it ourselves so in that way we can make it relevant.” He went on to discuss how this use of the intranet has come from “departments that were already users of the library both in ICT and in a book sense.” These “existing users” of the library rather than the members of the working party have been significant to the way their intranet has developed. He stated “it has come from within. I didn’t think that is the way that it would go.”

Depute head 2 reported that access to the intranet in the classroom has meant that it is being used with more able pupils, as extension material. With more machines in classrooms more pupils could benefit. Depute head 2 talked of departments using the intranet in different ways “we are encouraging them to do this and the biggest difference is the change in the attitude of the staff.” Librarian 2 mentioned discussions with teachers on how much class time is spent preparing pupils for research. By putting information on the intranet in advance and setting this as homework, pupils would be better prepared before they get to class. This allowed more time for in-depth discussion in class.

Librarian 9 felt that there was a growing amount of suitable material for the Scottish curriculum. ICT co-ordinator 1 felt the intranet had made a difference in the way some departments work in the classroom, not just preparing lessons but in accessing the Internet. However he was not building curriculum content for departments and there was little to show that departments themselves were building up such information collections on the intranet.

The lack of suitable content did not appear in schools where librarians have been key to populating the intranet with Internet resources but was mentioned as a barrier to development of intranets in other schools. ICT co-ordinator 10 talked of teachers wasting valuable time “sifting mounds of information on the Internet.” Head teacher 3 considered that there was a need for high quality online content before the intranet could be integrated into teaching and learning. ICT co-ordinator 12 was critical of the lack of materials to support the Scottish curriculum. Although websites such as BBC Bitesize were good, many of the curriculum support sites were aimed at the English curriculum. He felt there was a need for writing parties to generate materials for the Scottish curriculum.

Librarian 8 felt subject specialists at authority level could have helped with content. Schools in Authority C, where the intranet development officer had talked of advisors working on curriculum support for the authority intranet, appeared unaware of this support. Only in Authority E was there evidence of subject support from the Authority website.

6.5.11 Teaching method

Previous research in school librarianship had identified that teaching methods adopted by schools could be significant to the use of the library (Valentine & Nelson 1988). Questions were asked in relation to teaching style and use of the intranet. This was difficult for individuals to respond to on behalf of the school. Head teachers were defensive mostly taking the stance that school policy was to encourage a range of teaching styles. ICT co-ordinators were more supportive of the significance of teaching style eg ICT 12 stated "certain subjects you can see that they have that ability, others....it is the subject it is the way it is being delivered traditionally by them it takes a wee while for them to come across to the new way of working." He also talked of some teachers not understanding "the process skills of researching and finding and so on." ICT co-ordinator 14 felt that some teachers were too set in their strategies. ICT co-ordinator 13 stated that some subjects lend themselves more easily to use of ICT but also considered that some members of staff were more confident and open minded. Librarian 5 was more definite on the teaching style of the teacher being significant, reporting on a library project using evaluated websites involving two teachers from the same department. The different success rates he considered were due to the different styles of teaching method.

6.5.12 Training

Many schools have had low levels of training (3, 4, 5, 7, 10) which has not been ongoing and has not covered a range of ICT skills. There was an expectation in these schools on the NOF training. Some schools have had better levels of training but which has been erratic and concentrated on basic ICT skills (6, 8, 9, 11). In these schools it appeared that the training has had little impact on use of the intranet or on the specific technologies which can form part of the intranet.

Four schools appeared to supply regular in-school training which had a positive effect on staff use of ICT (1, 2, 12, 14). Schools 1, 12 and 14 made use of in-school timetabled training sessions but Schools 1 and 2 also mentioned the value of "informal" training on an "as needs" basis. For example the head of Business Education in School 1 ran a course on

spreadsheets after teachers in the staffroom mentioned that they would like this. In School 2 the ICT co-ordinator and librarian ran lunchtime courses for staff on topics such as Microsoft Works and Internet searching. These were criticised by some staff as allowing the authority “off the hook.” They stopped for a while. The ICT co-ordinator restarted them “because ultimately they save me a lot of time.” ICT co-ordinator 12 talked of providing different levels of training for staff as required (Basic, Intermediate, Advanced). All of these schools talked of training on a range of software. ICT 14 stated that the main training he was providing was on PowerPoint. ICT co-ordinator 1 reported that departments could request training eg CDT had just received new machines so had been given extra training.

Three schools mentioned supplying training materials to staff to use in their own time

- School 1. When new software comes into use (eg the reporting software for staff) an email is sent to staff with “help and hints and instructions on how to do things”
- School 2. Notes of courses are available on the intranet
- School 12. Interactive training in EXCEL, PowerPoint, Word, Email and Outlook Express

ICT skills assessments of staff have been undertaken in Schools 1, 12 and 14.

Questions were also asked about what training was supplied by the authority to support development of intranets. Most schools had yet to start (or were just starting on) their NOF training for teachers. Authorities had provided

- professional development training where teachers could opt to do courses on ICT (in most schools)
- “targeted” training for teachers in subject groups who had access to ICT (10)
- training for managing the network and running servers. This was mainly aimed at ICT co-ordinators (mentioned in Schools 2, 11, 12, 14 but likely to have been more widely available)

Schools 1, 4, 7 and 11 talked of authority courses being inappropriate, often not at the right level. Other complaints related to twilight courses being unsuitable, lack of time to do the training, teachers not having the basic skills to go on courses and having to wait for the NOF training. There was no evidence that specific training from the authority has had an impact on the development of the intranet itself.

6.5.13 Information skills

The question of information skills was raised as part of the librarian's role (see section 7.3) and also in terms of whether schools had addressed these in light of increased ICT. As will be seen from the librarian's findings, lack of information skills, particularly in senior pupils was a key issue.

Appendix 15 provides details of the information skills as offered by schools (excluding the librarians input). Although most schools were providing information skills to S1 and S2 pupils in some form or other, there was little evidence that schools related this to the use of the intranet or saw the intranet as a tool for promoting information literacy. Librarian 9 pointed to the information skills policy as a reason for teachers being very aware of ICT. Yet the ICT co-ordinator felt that teachers needed more support in how to integrate the intranet into their teaching and did not promote the intranet as a device to support their information skills programme. An information skills programme on its own was not seen to be significant in encouraging intranet development.

6.5.14 Finance

It was pointed out that authorities had invested large sums of money in technology. Financial support was generally for the network infrastructure, the hardware and in some cases the intranet package itself. A number of schools had also spent substantial amounts of their own money on extra computers and extra servers. There did appear to be a need for more funding to enable schools to support whole class use. No figures were sought to make direct comparisons of funding within each authority. It was clear from statements made, that Authority C through their authority intranet have invested the most money. What can be seen is that the three schools studied in Authority C were not the three leaders in intranet development within schools in this research.

School 5 as a pilot was given funding from the authority for extra library assistant hours to work on the intranet. The depute head felt that even without this, the current librarian would have looked at other ways of getting some kind of support.

Schools raised concerns about ongoing costs and long-term costs of maintenance (4, 7, 11, 12, 13).

6.5.15 Local authority intranet

Schools 7, 11 and 13 had access to a developed authority intranet (Authority C). Other than the online training courses there was little evidence that teachers in these secondary schools were making great use of this intranet. ICT co-ordinators 7, 11 and 13 gave lack of time whilst librarian 11 suggested it wasn't relevant. None of the ICT co-ordinators considered that teaching staff were using the authority intranet although ICT co-ordinator 7 suggested that perhaps the administration staff might use it (eg searching for prices from the central purchasing unit). ICT co-ordinator 13 pointed out that the authority intranet was set as the home page so staff could not ignore it. Head teacher 11 suggested the authority intranet was meant to save on paper, and stated "obviously it is good for publicity." He in contrast considered it well used and talked of more and more information becoming available. He gave the example of the *Draft Service Plan* which he was encouraging staff to look at. He wanted staff to get into "the habit" of looking at the authority intranet. There was no suggestion in these three schools that they were looking to base their own intranets on the authority intranet. Instead it appeared that their internal intranets would meet a different need.

Schools in Authority E (2, 3, 4) had access to a well developed authority website. ICT co-ordinator 3 talked of looking at this to see how "it develops and pans out" before pushing staff to develop materials for their own intranet. School 2 the most advanced of these three schools made regular reference to the use of the authority website for curricular support. However their own intranet provided evidence that the bulk of that content was built around their own class lessons and in-school events. No other schools made significant reference to authority intranets or websites.

6.5.16 External characteristics

There was an acceptance that the government were behind authority decisions to network. No school considered that there was external pressure from either the government, local authority or any other agency to have an intranet. There was little difference in attitude between those who had been given intranet grids and those who had to build the intranet themselves eg head teacher 7 stated "I wouldn't say that there was any pressure to do it."

Depute head 2 indicated that NGfL money had helped purchase PCs and stated "we wouldn't be advancing as quickly but we were on the road before this happened so it has enabled us to

do things perhaps quicker than we would have been able to afford.” Although not a pressure, government funding had been an aid.

Head teacher 1 stated that his experience in TVEI had taught him that a whole school and whole authority approach to technology development was necessary for all schools to be able to progress.

A number of individual impetuses were mentioned such as skilling pupils for life, working in a knowledge based industry (as opposed to more traditional heavy and artisan industries), use of ICT in motivating pupils with learning difficulties, and pressure from SQA for pupil folio work submissions. But these could be related to ICT in general and not specifically to the intranet.

There was general agreement that the Scottish curriculum was an impetus for developing ICT. Head teacher 11 gave this as the reason for departments highlighting innovative use of ICT in their development plans. Mention was made of 5-14 and Higher Still requirements. ICT co-ordinator 13 considered that departments generally were taking on more ICT within their subject areas. Head teacher 3 pointed out that Advanced Higher points have become essential for university entrance. His school had not staffed Sixth Years Studies adequately but felt that they must make an effort with Advanced Higher. He saw the intranet as part of the solution and related it to how they dealt with distance learning. This could be an impetus for the school to develop the intranet. Yet ICT co-ordinator 3 had stated that one of the problems was no external pressure for the intranet.

Not everyone was in agreement that there was a need for so much ICT in the Scottish curriculum. ICT co-ordinator 11 stated “Higher Still developments in all subjects has highlighted the need for ICT and Internet/intranet access. I don’t feel that they are all justified.” Assistant head 12 added a proviso that it should be there as a “tool ” and not simply there for the sake of it.

The HMI was mentioned as an external pressure by three schools (2, 7 13). In School 2 an inspection was the instigator for librarian involvement with the PE department, firstly in using the digital camera and secondly in looking for websites. This encouraged other departments to make requests, which then became the impetus for the librarian to develop

the intranet. Head teacher 7 reported that an HMI inspection encouraged the school to look at how ICT could make a greater impact on teaching and learning.

6.5.17 Evaluation

The technical literature on intranets had suggested that organisations should evaluate their intranets. The grounding visits and authority visits suggested that schools were not at the stage of evaluation. This was borne out in the main interviews where almost all schools responded negatively to questions of evaluation. A number indicated that they were “monitoring” use of the intranet. Librarian 5 had written a report to the ICT strategy committee on how the intranet was working. This concentrated on the implementation stage of the intranet rather than on learning and teaching.

School 1 had used a staff questionnaire to help in their ICT development. The main findings were

- high use of email by staff
- low use of ICT by staff in teaching and learning
- need for better class access

The survey indicated that they needed to look at more flexible ways for pupils accessing the technology, hence the investment in mobile wireless technology laboratories. Although this appeared helpful to ICT development, it has not progressed the school as a whole in making better use of the intranet.

6.6 Future Developments

All subjects were asked how they saw the future of their school intranet developing. A number of respondents referred to the importance of building momentum and of how staff confidence would lead to more rapid changes. The expansion was also seen in increasing the number of departments contributing to the intranet.

Suggestions for the expansion of uses included

- Less paper more email communication (ICT 12).
- Intranet becoming main gateway to the Internet (ICT 11)
- Administration (particularly 1,5,13)
- Homework (Depute head 2, librarian 2, ICT 12)
- Parental involvement (librarian 2, ICT 12)
- Use of the intranet as a base for developing the website (School 2; librarian 8)

- Flexible Learning Centre (School 1)
- Increased use of wireless technology (School 1).

There was a range of attitudes to the future of school intranets. Head teacher 7 was optimistic saying “ I think it is going to be fantastic.” ICT co-ordinator 7 used the terms “vibrant” and “evolving” stating “I think it will be a success and I think it will be an essential part of any school.”

6.7 Conclusion on intranet development findings

As the questionnaires and authority interviews suggested although the intranet provision may come from authorities, intranet development is a matter internal to the school. The internal culture of some schools can be seen to be supportive (eg 2, 5) or more directive (eg 1, 7) whilst there are also clearly some schools which appear indifferent and where the intranet is not seen as a priority (eg 3, 4, 9, 13). It appears that despite the presence of intranet technology it may be years before some schools find the impetus to develop their intranets. Yet even within these “indifferent” cultures it is possible for some development to occur. To make that leap schools appear reliant on individuals making the most of opportunities to take the intranet forward (eg 9). Within the directive culture there is emphasis on attempts to plan centrally, to direct through questionnaires and working parties (eg 1, 7). Within the supportive culture there is evidence of organic development as individuals and groups work together to build their intranet as required to meet their own developing needs.

Findings relating to the content of the intranet in schools indicate that there is a low level of “flat” content. Schools have not used the in-school intranets for policy documentation or for administration. This contrasts somewhat with suggested stage development in business intranets where information distribution was seen as the first stage. For those schools which have worked on their intranets, the first stage appears to be curricular support through subject URLs (interactive) with the next stage being school events and in-school instructional materials. These would appear to come from meeting the curricular needs of the school and adding to the ethos of the school. Both are relevant to school needs. The theory section will look to broaden this explanation for the way the intranets have developed in schools.

7 Findings. Interviews in schools: The role of the school librarian

Evidence for the role of the school librarian has been gathered from across the range of interviews. Tables have been provided to summarize data at the start of a number of sections. This information and all quotes have been taken from the analysis sheets provided by NUD.IST.

A difficulty in analyzing this research is that despite the presence of an intranet in each of the schools, the separate “technologies” can be used on their own. Despite there being an intranet in place the librarian may use only the Internet and so have little to do with the intranet. For this reason responses are discussed in general terms first, then specific examples using the intranet technology will be given.

7.1 General role of the school librarian

The term used most frequently in relation to the role of school librarian was that of “support” e.g. “supporting the teacher” (head teacher 2) and “a support to all the departments in the school” (librarian 9). It was also clear that librarians saw themselves as having a variety of roles. Librarian 11 felt that “a school librarian’s role is to play every possible role that you can imagine in any kind of library.” Librarian 10 stated “I think there is a whole lot of roles for the professional librarian within the school which keeps on extending really.”

Two librarians separated the role of the librarian from what they were doing with the technology: “My role? I don’t know quite where to start. Apart from being the librarian I’ve designed, what was, is going to be the website” (librarian 2). And librarian 5 similarly talked of the “usual what you would expect of the librarian” and then added “There is also the IT side of things which is more and more time consuming.”

7.2 Resourcing roles

A role was identified for the librarian in accessing information e.g. “Support for the teachers in providing the information for their project work” (librarian 8): “disseminator of resources and information” (librarian 6). ICT co-ordinator 10 talked of this being “the traditional” role of the school librarian, the only change being the storage of information. The importance of access to the technology within the SLRC was stressed. Within this context head teacher 10 talked of the librarian as a key person “in identifying where best to start young people access information.” Specific aspects of resourcing related to an intranet will now be discussed.

7.2.1 Internet searcher

There was variety in the extent to which librarians carried out Internet searching. Some librarians gave little evidence of Internet searching (e.g. librarians 4, 6, 13). Librarian 4 when questioned avoided a direct answer but stated of teachers "A lot of them don't see the use of the library at all and that is a fight." ICT co-ordinator 4 stated that staff still very much viewed the library as a book resource. Librarian 1 considered that teachers used the Internet extensively themselves in the classroom with some teachers bringing classes to the SLRC to do Internet searching. She thought that most staff felt "that they should be confident enough to do it themselves." However she did carry out searches for staff if they were short of time or needed information in an emergency.

The notion of librarian as expert in Internet searching appeared in a number of interviews (librarians 2, 5, 7, 9). Librarian 2 considered that "staff who could easily do things themselves tend to get me to do things like find information that is easily enough found on the Internet." She gave the example of finding a publishers address for a teacher on the Internet "within seconds." Librarian 2 considered that she was viewed as an information manager and said "you are seen as somebody to get information to save teachers doing that." This was reiterated by the depute head in School 2 who said "they are experts in finding and guiding people towards the information that they are looking for. But now there is a huge difference. It is through the Internet or intranet." Librarian 9 stated that he could find information quicker than anyone else in the school and "about ten times faster than any of the kids can." ICT co-ordinator 14 also talked of librarians building up expertise in searching the Internet: "One would assume that what we are seeing here is that it is something that librarians require to have in order to maintain their credibility I would say with teaching staff. I really think that teaching staff should also acquire it but they are not necessarily going to be doing that in the same time frame."

7.2.2 URL support from the Internet

Librarian 7 recorded Internet URLs in a loose-leaf binder organised by subject "I started that right away at the beginning because I realised that there would be certain sites that would be of use to various people. Em it's something that I think would be developed." The librarian asked staff for links to be added to the collection. These were kept in the SLRC and hence distanced from subject departments. The librarian recognized that it would be better on the computer but had no time. She found it easy to do in book form, but hoped it could go on the computer later. The ICT co-ordinator and head teacher were aware of the librarian's efforts.

Despite the head teacher being supportive, the ICT co-ordinator was dismissive stating that departments would keep their own links "I don't see that they will be in the library section. I think departments will have more control of their own web links. I think what the librarian thought, well it is good for her to know web links which the children will come along to, or see in a free period or something like that, right, she should have a list of those things but departments will do that." The ICT co-ordinator went on to suggest that perhaps the librarian could take a copy of departments URL links.

School 7 was not alone in not seeing the SLRC or librarian as a focus for development of curriculum related Web links. ICT co-ordinator 10 stated that no-one yet undertook this role in the school "it would tend to be most sensibly done by the subject expert because they are the people that know." He spoke of the need for someone at authority level, possibly a seconded teacher to undertake this to save on repeating the task across schools. When suggested that this was a possible role for a librarian the response was that "the librarian does not have the same curriculum expertise." Departments have the subject expertise and though a librarian might find information on a subject, it may not be of an "appropriate level."

Similarly in School 6 the ICT co-ordinators response was "em sites of interest obviously within her area but obviously we want curriculum based. The library is not curriculum based as such but as an addition to the whole thing." As stated in the findings on intranet development an ICT class under his supervision would provide suitable curriculum sites. The ICT co-ordinator saw it as his role to develop the pages of links for subject departments. Librarian 6 in a demonstration of the intranet grid showed the researcher the "curriculum links" supplied by the Managed Service Provider but admitted to not having used many. The librarians in Schools 6 and 13 were aware of others creating lists of curriculum links but neither had started work on this themselves.

Librarians 1, 3, 4, 10 and 11 had a low-key approach to supporting research with curriculum links, mostly bookmarking these on library computers. Librarian 11 allocated time each week to look at new websites encountered in educational newspapers and journals. Although these would eventually go onto the intranet she chose not to advertise this to staff or pupils. The reason she gave was that she did not want to "raise expectations." Librarian 10 said she tried "as far as my limited time is available." She had URLs on her favourites under subject departments but said that there was "very little use made of them." She did not have time to

push use but felt that there was not a great demand and would not be unless someone from authority made a big “hoo-hoo.” Librarian 3 also lacked encouragement “I can spend as long as I like looking at sites or information I think would be really useful for various departments but if I can’t get the departments to actually use them themselves then it’s a complete waste of time.”

Other librarians had a more prominent role in providing URL support (2, 5, 8, 9, 12, 14, 15). Librarians 8 and 14 did not use the intranet. Instead they build on what they have previously provided in their work with departments. Both of these school librarians had high involvement in departmental related research. Librarian 8 visited departmental meetings and in discussion on projects tried to encourage use of the Internet, offering to search for specific subjects: “one of the big things is actually highlighting specific websites which myself and subject departments have looked at which we think would be suitable for pupils.” She gave an example of revision sites. The main reason for not using the intranet to highlight these websites is that the librarian has not received any training in maintaining web pages and has yet to receive her NOF training. The librarian talked of an in-service she had given to teachers where some of the teachers had expressed surprise when she said that she would undertake Internet searches for them. Assistant head teacher 8 felt that principal teachers had some responsibility as subject specialists but talked positively of the librarian’s role in supporting staff in this way.

The librarians in School 14 had a large collection of project material which have been gathered together into “project packs” ready for pupils use. The URL information had been written up and added to the project packs. These were particularly useful for less academic classes which required more structured support. In the librarian’s view this “saved time” on the computers. Librarians 14 also bookmarked URLs, made lists of these and sent suggestions to departments. They did not put URLs on the catalogue as there was not a module for it. Although they had completed their NOF training and had plans to start work on web pages suitable for research purposes this had been put on hold whilst the intranet was taken away. The librarians were less confident about using the website for maintaining URL support.

The intranet was the focus of Internet support in the remaining five schools. Librarians 9 and 12 have only recently set up pages with Internet sites to support subject departments. Librarian 12 talked of the templates available from RM whereby departments could add their own links in the subject area and “list of cool links.” He considered that no member of

teaching staff in the school had yet added to these and gave lack of staff time and expertise as the reasons. There was concern for the librarian in that "obviously I don't want to usurp the role of other departments" by setting up his own links. He stated "at the moment it is not happening in departments then I think that the library could produce useful links and I don't mind em eventually my page being put somewhere else on the intranet if that is more appropriate."

Librarian 5 had talked of the key purpose of the intranet being to supply staff with curriculum related links. The Managed Service Provider had placed URLs on the grid. Despite the fact that the sites were alleged to be aimed at the Scottish curriculum much of it was irrelevant, had broken links or was slow to upload. The librarian has spent time developing his own evaluated and tested links. Of all the schools visited School 5 had the most extensive set of links going across all departments. As a pilot school they had been given extra time to work on the links which the authority may now use in other schools.

School librarian 2 had also developed curriculum links with departments. However instead of working on the grid and developing links centrally this librarian took a subject approach based on project work in the SLRC, often with supporting worksheets available on the intranet. She gave the example of the History department "One of the history teachers is doing local burghs and stuff so I got a load for them and they click on the information that is there and we have ended up that we now have that integrated into part of the timetable and they come down to search the Internet and use a booklet that we have produced." The librarian described her involvement as "More worked jointly but mostly with my material because the teacher concerned wasn't that proficient." She mentioned other departments where she worked in a similar way to provide URL support- science class on heart disease; chemistry class and stated "That's part of my plan this year is getting more departments involved."

Librarian 15 regularly emailed staff with URL information. Teachers had started with their own departmental pages providing URL links. The librarian was asked to do something to support the homework club so he suggested maintaining a website. This homework site was developed in collaboration with departments. It had become a central subject support area for all departments. This was a very recent innovation despite the intranet having been in school for over four years. The homework pages provided supporting links to pupil projects but also included background information and the questions set for homework. When asked to take

responsibility for the homework site the librarian firstly requested recommended websites. Not every department had given links but most had promised. The homework website was set up for S1 and S2 but has expanded to include seniors. It was only available on the intranet but would eventually go out as part of their planned school website. The librarian still maintained his paper project folders as he considered it necessary to spread resources with large classes in the library. In these he included newspapers and leaflets, printouts from the Internet and information on appropriate URLs. He pointed out that pupils were discouraged from freely searching the Internet. They did not have time. He felt they still required structure through the evaluated websites. Only if they couldn't find anything would they be encouraged to "free search."

7.2.3 Downloaded websites

It is possible to download suitable material from the Internet and make this available on the intranet as required. The Japan Project had suggested that both schools and school librarians would be likely to use this facility on their intranets (Wells, 1999). The evidence in this research was not supportive of this.

In School 14 the ICT co-ordinator considered that their new broadband access to the Internet would mean that there was less need for downloading in the future. This new system could cope with whole classes accessing at the point of need. Librarian 5 stated that as a school "we tend not to download them, we tend just to point to them." Librarian 15 was of the same opinion. Librarian 9 said "It is something that could be possibly done, I don't know about the copyright but that could be looked at." The ICT co-ordinator 11 commented on the advantage of focusing "pupils attention on a particular area without the battle of going on to the Internet." Time for teachers to cache the sites meant that it was not happening.

Only two schools appeared to make use of downloaded websites. Both librarians (2 and 8) reacted positively. It was not having an impact on the role of the school librarian as neither were directly responsible for the caching.

7.2.4 Role of school librarian with online resources

In the authority interviews the intranet officers had implied that this was a low priority for schools. The interviews in schools supported this as few schools had subscription services and librarians appeared to have little influence on these.

Generally school librarians considered online services to be too expensive. Librarian 15 pointed out that another school in the authority provided the library with a budget less than the annual subscription to Encyclopedia Britannica. He stated that the authority had taken on free trials of e.g. Oxford Online but had never subscribed. School 2 had used FE PROFILE which she said was "great" but had given this up due to cost. Librarian 5 mentioned a subscription to the Economist. One of the schools using the Managed Service Provider RM, had access to "EDUWEB" (12). But the librarian had no influence on this decision.

7.2.5 Role of librarian with CD ROMs

The authority interviews had suggested that school librarians may not have a major role in purchasing, managing and advising on CD ROM use. This was borne out in the interviews in schools. The question of CD ROM use and networks/ intranets appeared problematic for many schools as issues of security, licenses for networks, and central purchasing were tackled. ICT co-ordinators talked of CD ROMs on the network as separate applications, but not on the intranet. The basic question of librarian involvement in CD ROMs, an application which could be used through an intranet, is still of value.

Librarians 1, 2, 3, 8, 14 and 15 appeared to have central roles in purchasing and advising on CD ROMs within the school. Librarian 1 was given a specific role in charge of CD ROMS as part of a major project with an outside agency. Her role included distributing the software and advising departments on its use. For the librarian this role enhanced her status, allowing her to be seen as an expert in CD ROM technology. Yet despite this it was also clear from the ICT co-ordinator's interview that he was still seen as the main contact for ordering new CD ROM technology.

Librarians 2, 3, 8, 14 and 15 all discussed purchasing CD ROMs for the whole school. Librarian 15 felt he was still seen as the subject expert with most CDs kept in the SLRC. Librarian 8 mentioned an increase in her CD ROM purchasing (and of videos). This she related not to the intranet but to the fact that the school had purchased a number of screens which allowed teachers to show the materials to the whole class.

All librarians purchased CD ROMs of general interest for the SLRC. Librarian 5 talked of the need for a better budget if he was to have a more central role in purchasing CD ROMs across the whole school. The technology (new CD ROM server) meant that there could be more centralization. However, the librarian felt that this would cause huge problems. ICT co-ordinators 6, 11 and 12 talked of CD ROMs as a subject specialist's role.

Some schools mentioned problems with the copyright and networking of CD ROMs (1, 2, 9). Librarian 9 stated that to make a CD ROM accessible "it requires an RM technician to come in, disable security protocols, install the CD and then do all the security protocols again. It's a rather turgid sort of procedure to go through to get a CD ROM." For this reason he kept an old machine in the SLRC which was not connected to the network and where stand-alone CD ROMs could be used by departments. He considered that the six CD ROMs which were networked (from the MSP) were not used by many departments. Librarian 6 (in the same authority) also talked of providing access to stand alone CD ROMs not on the network. It did not appear to be an issue in Schools 1 and 8 where the librarians talked of having CD ROMs installed on individual machines in different departments as required.

7.2.6 Whole school resource manager

No schools yet have their complete catalogue available across the intranet. Schools 13 and 14 were soon to have it on the network. School 13 had just acquired licenses to do this with the ICT co-ordinator stating that this was a priority. Librarian 8 was enthusiastic about whole school resourcing via the catalogue including departmental collections. Librarian 2 was equally positive but was waiting for the new TALIS system from the authority which she had been told would use HTML and thus be capable of being part of the intranet.

The fact that no schools had their catalogue available on the intranet made it impossible to investigate how this has affected the role of the school librarian. There was some evidence from School 14 who had been able to have the catalogue on the network within the SLRC. In the three interviews in this school, all were keen to see the catalogue as a whole school resource. The deputy head stated "Technically some of it could be made available to any work station on the network so that each department could have their resources catalogued, both book and non-book and hot-linked to websites." This was the only school where anyone other than a librarian talked of the positive side of using the catalogue across the school. However he did not necessarily see it as the librarian's job to catalogue the resources stating it could also be done by subject departments.

ICT co-ordinator 7 considered the possibility of a database with a search facility for the catalogue which could go on the intranet stating "we will have to really work on that and get ourselves tuned in." It was evident that this was not something which had been discussed with the librarian.

ICT co-ordinator 11 in contrast stated “it is a possibility but I can’t see any use for it” and talked of the reluctance of departments to give the library their collections. However most librarians only want the knowledge of resources made available.

7.2.7 Resourcing role – Stage of involvement in curriculum related research

The interviews were studied for evidence of librarians’ involvement in the planning for pupil research and how this could be used in relation to the intranet. As mentioned librarians 2 and 8 visited departments. For librarian 8 this was a formal set-up with the librarian attending departmental meetings on a regular basis to discuss new courses which included liaising over websites.

Librarian 2 did not follow a formal plan of seeing all departments but stated she could visit at any time to arrange a meeting and put an “issue” on the agenda. However most of her contact was done via the staffroom at break, lunch or after school. With her new auxiliary she expected to have more freedom to leave the SLRC. She had set targets of involving specific departments: this year RE, History and Geography. RE was selected as staff were ICT proficient and already had a presence on the intranet. This task included overhauling the information, more support material for homework, and using pictures of different local places of religious worship each month. The ideas appear to have been jointly suggested and discussed. History was chosen because one of the History teachers already used the SLRC for a research project and the librarian saw that “We’d work well together in taking this a step further to develop this into an instructional website.” Geography was chosen because they do a project on volcanoes which the librarian is aware has a wealth of suitable Internet sites to support it. She said that the teachers were “scared” of ICT. “I think it would be a good way of introducing this department to ICT through a positive experience.”

Both librarians 2 and 8 talked of developing worksheets and of making suggestions to staff about using library resources. Librarian 12 had not yet had time to be involved to this extent but stated “One of the tasks (NOF training tasks) is consulting with staff about use of ICT and how the library could perhaps help that.” There was surprisingly little evidence in the other interviews of school librarians involved in the planning side of providing information resources to support the curriculum.

It was expected that all librarians would be involved with teachers at the resourcing stage of research. However librarian 11 answered “no” stating “I get plunged in at the deep end.”

And librarian 5 although often included in discussions on resourcing needs added -“it varies a lot. There are some teachers who just like to book the time and then they do their own thing. There are others who come to you beforehand and say this is what we are doing.”

No librarians were regularly involved in pupil evaluation. Librarian 5 commented "I don't know if we want to get involved in that way. I think there are some teachers who would not be very keen on that."

7.2.8 Other information roles

Appendix 16 details the information on the school librarians' involvement in careers libraries, staff libraries, supported study, community use, flexible learning and distance learning. It was considered possible that librarians with a high involvement in one of these other areas may not have the same time to give to the intranet. However librarian 2 immediately dispelled this theory as she was heavily timetabled with careers talks and had a large staff library which she promoted on the intranet.

There are clear differences between schools as librarians have varying levels of involvement in these other areas. However it did not appear that time commitment to these other areas was a key factor in their not being involved with the intranet.

7.3 Instructional Roles

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Infor skills class	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	no	yes	yes	yes	yes
ICT skills to pupils	yes	yes	inf	inf	yes	inf	inf	yes	inf	yes	inf	yes	yes	yes	yes
ICT skills to staff	no	yes	no	inf	no	no	inf	no	yes	yes	no	P	no	Inf	yes

Table 8. Role of the school librarian in information skills support

The above table indicates which school librarians provided an information skills course, ICT skills to pupils and ICT skills to staff.

Inf = informally, not as part of an information skills course

P = planned

7.3.1 No information skills course

All except librarians 9 and 11 provided information skills instruction as formal classes to a variety of year groups. School 9 had a whole school policy on information skills, including ICT skills which was covered in Religious Education. There were not enough facilities in the SLRC to support class instruction. The librarian stated "I think it is actually difficult for the children to get to grips with using the intranet properly ... In the library they get to use the PCs in a slightly, lot less formal basis, but they are given more freedom on it but they still have me around to show them what they are doing wrong or to help them." School 11 was one of the largest visited (see Table 6). The size of the school was the reason given by the librarian for only being able to provide a basic induction visit to the SLRC. This covered using the catalogue and "anything else is a bonus." There was no whole school policy on information skills. The librarian indicated that the Internet had meant the need for more one to one instruction and was unhappy about pupils "free" searching. The lack of information skills in senior pupils was mentioned. Librarian 11 provided "informal" instruction on use of ICT as required.

7.3.2 Information skills course without ICY content (3, 4, 6, 7, 8)

These five provided an information skills course but did not include ICT skills. They all provided individual assistance in ICT use. Librarian 8 was aware that pupils were frustrated at not getting access to technology in the school. "You know the thing is there but we are not

really letting them use it.” There was not enough time in her information skills course to include ICT. She has offered workshops through the homework club. Recently she proposed a set of lunchtime workshops for pupils on using the Internet, search engines etc. This would be on a first come, first served basis. This librarian saw a key role for herself in teaching CD ROM use, Internet searching and in particular research skills. “I think I am probably one of the few people in the school who are probably doing that with the pupils which is why they need more of it.” The library issue system had recently been computerised and not all pupils had yet been inducted in the new system. The librarian was looking at putting a PowerPoint presentation on how to use the computerised system onto the intranet. In talking of improving pupil ICT skills she stated “I would like to see myself in more of a role in actively going out and improving and setting up opportunities for pupils to improve their ICT skills within the school... Because they tend to give the first years a quick use ... it is maybe a four week course in computer skills and we leave them and we don't come back to them ever again.”

Computing and Business Education provided S1 and S2 instruction in ICT in School 7. The librarian had no direct involvement in ICT instruction, but was available to help subject teachers who came to the library to use the ICT suite. She gave examples of helping pupils in searching and evaluating websites and commented on poor searching by pupils. School 6 also had no ICT in their information skills programme but the librarian said this “is something I would like to change for next session.”

School librarian 3 did not include ICT in the information skills course but talked of the possibility of using the intranet to host a website on information skills. This would be “something on the website that the pupils could sit down and work through themselves because I really don't seem to have time and space.” Not every machine in the SLRC was connected to the intranet. The librarian felt that involvement in information skills would change more if further facilities were attached to the network.

Librarian 4 intended to change the information skills course to include searching the Internet but not all pupils had network access yet. The head teacher talked of a proposed new course in S3 for information skills using ICT. The librarian had input into this but he also stated that it would be up to departments to prepare pupils. The librarian made no mention of this S3 course and showed concern over lack of thought by teachers on how the pupils were going to use the technology. The librarian felt that pupils would be sent to the SLRC to use the

Internet without much consideration of searching needs. This concern was shared by librarian 8 "we are trying to get across to the departments, please don't send pupils to do just a vague search, either give them a specific web page or a very specific search strategy." The librarian stated that "staff don't realise you know how sophisticated pupils have to be to do searching... they tend to be a bit free with it. They need to be much more structured."

7.3.3 Information technology instruction (1, 2, 5, 10, 12, 13, 14, 15)

Eight librarians gave instruction on either Internet or CD ROM to lower secondary school pupils. School librarian 1 talked of waiting until the pupils had received basic ICT training from Computing before introducing it in the information skills programme. This allowed the librarian to "try and reinforce" what they had already learned in Computing.

Librarian 13 talked at length of pupils lacking information gathering skills. On teaching ICT skills he said "as I say I have been producing worksheets for kids but nobody has asked me to do that." These worksheets were something he initiated and suggested first to the History department but he hoped to involve more departments.

Librarian 10 provided a six-week course on information skills, part of which included an introduction to the Internet and CD ROM. The librarian did not consider that she studied it in any great detail with the pupils. The head teacher talked very highly of the librarian and of what she offered "the library has always had a high degree of technological involvement and the librarian has worked closely with staff and pupils in terms of taking forward their skills." The librarian however felt that the school had not tackled the issue of information skills and gave examples of poor searching undertaken by pupils.

In School 14 the librarians had previously been part of a whole school information skills programme based on the topic of "Scottish Studies." The AHT stated that the staffing of the Scottish Studies course had become increasingly difficult whilst the school recognised that there was need for more ICT. In the past year "Scottish Studies" has been discontinued to allow an ICT course for S1 provided by Computing. The AHT stated that the librarians would still be providing the non-ICT aspects of information skills fitting this in during their English time. The librarians were now limited to six periods in the year for S1 information skills. They stated that they did include a very quick introduction to the Internet and CD ROM.

Librarian 12 felt the S1 information skills course which ran in his school should be changed to a topic based library skill induction to cover a wider range of information sources. He had recently "cobbled together" an exercise for the S1 course on the use of the Internet but had not yet had a chance to evaluate this. He included links to Yahoo and Ask Jeeves for Kids as a starter to help students on the library intranet homepage and was keen to develop the information skills element there. The ICT co-ordinator intended to use the librarian to deliver pupil training in ICT skills in the future, but did not provide details of this.

Librarian 2 had recently re-done the S1 information skills course reducing it to four lessons. This librarian had taken the decision that the previous course was unnecessarily long and that there were better ways of working with departments to develop information skills. The third of these S1 lessons was on ICT with the fourth lesson "a kind of mini project that ties all of the information together."

Librarian 15 provided an S1 information skills course on the theme of pirates. The pirates instructional website was on the intranet and included the use of

- Authority catalogue, searching for books
- CD ROMs
- Internet sites

This librarian did not encourage free searching of the Internet by pupils but specified that where this was necessary he encouraged pupils to use the BBCi search engine.

In most schools the librarians only offered information skills to S1. The exceptions were Schools 2 and 5. In School 2 senior pupils were given advanced searching on the Internet, revision skills and note taking. The librarian considered that this was what they required for university or college. The ICT worksheets were kept on the intranet.

Librarian 5 felt that the intranet had highlighted the need for information skills e.g. skim reading and note taking but added that it would be a difficult thing to prove. This school included a primary school. The librarian introduced the Internet to Primary 7 and CD ROM in Primary 6. It was planned that information skills would soon be introduced to Primary 5. At present they continue through to S1. The depute head talked of the strategic planning "necessary for this to happen." He described the librarian's involvement in supporting ICT information skills as a "crucial" part of his role. Unlike other schools the S1 and S2 Computing department which had previously taught Internet searching has had its time cut.

The SLRC was filling the gap. The librarian was keen to work with S2. At the moment they were unable to provide anything for senior pupils and the librarian talked of them being "quite badly organised for information skills." Only some of the librarians' materials on information skills were available on the intranet.

7.3.4 Tutorial support

Even those librarians not supplying formal information technology instruction had a tutorial support role. This was clear from many interviews eg head teacher 6 "she is very knowledgeable about the issues and how pupils can access bits and pieces and is able to assist as a tutor. I see a lot of scope for *the librarian*, helping pupils with access to Internet/intranet" and ICT co-ordinator 3 "her time is called upon frequently throughout the day to instruct, give demonstrations that kind of thing."

Librarian 1 was positive of the help she could give teachers, "I think they are more willing as well now to bring classes in as I'm there as well. And when they bring their class in so there's two people showing them how to use the CD ROM. It is not going to be a case of one teacher and thirty. You're down to a group of fifteen. It's far more manageable." Library assistant 14 stated "all staff expect you to be able to help them you know when they send down a group to show them how to use the software" but felt it was "a bit of a grey area" as to who should be providing this. It should be noted that it was the library assistant and not the qualified librarian in this school who was most involved in ICT.

7.3.5 Staff Training in new technology

Four librarians were formally involved in providing staff ICT training. Librarian 2 was a "mentor" for NGfL training. This librarian had previously provided "ad hoc" training sessions to staff during the lunch interval with the ICT co-ordinator.

Librarian 10 had provided training on using specific CD ROMs. She trained the Guidance staff on PLANIT and PROGRESS and stated, "if I get a particular CD I'll try and interest a department in it."

Librarian 9 had previously been involved in staff training when there was only a stand-alone machine in the SLRC. At that point staff had come for training on the Internet and CD ROMs. He had not undertaken any training since the school was networked and implied that it was unlikely that he would be involved in whole school staff training.

Librarian 15 had given workshops for departments in the past. However he now considered that training to individual staff on specific packages in the SLRC was the best way forward. He was currently encouraging staff to train on Dreamweaver. He talked of motivating them on a one to one basis, making staff "stay on the case." He showed them how to make links, put in annotations, banners and buttons. He used the term "cascading" to describe the skills development of teachers in the school. His role was knowing what could be done, encouraging staff to create their own instructional websites, supporting on the technical side, and helping staff with knowledge of available resources.

Three librarians talked of giving informal training to staff in the SLRC (4, 7, 14) eg. librarian 14 responded "if somebody comes down to you. I would just show them what I knew you know it wouldn't be a formal tutorial or anything." Although librarian 8 had given in-service training to staff on general SLRC issues, she had not provided any training on use of ICT. She talked to staff about her role in Internet searching. The librarian makes available to staff notes from ICT courses which she has attended. Librarian 5 with a very prominent intranet role was not involved in any staff training. Librarian 12 appeared keen to become involved in staff training stating " it is something that I would like to envisage." The ICT co-ordinator indicated that he had plans to use the librarian in staff training but had not at that point discussed this with him. He talked of watching the librarian develop his home pages and of being impressed with his ICT skills.

7.3.6 Adult training

The school library officer in Authority C had talked of school librarians involved in training adults in the community. None of the school librarians in this research were involved in adult training.

7.4 Technology roles

School librarians undertook a variety of technical roles, including the role of intranet builder and manager. A number of librarians also had roles as network administrator. The role of technician support is treated separately. Librarians were also found to be creators of content for all types of information for the intranet and for instructional web pages.

7.4.1 Intranet Builder

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
No	Yes	No	No	Yes	No	No	No	Yes	No	No	No	No	No	No

Table 9. The school librarian as intranet builder

The above table indicates which school librarians were actively involved in structuring the intranet. Three librarians had a key role in “building” their school intranets. This involved structuring the layout of the intranet, deciding what the different sections were, what they were going to look like, how the pages were going to be linked together, creating banners and buttons. The librarians all used FrontPage. It was the librarians in all three cases who made a decision that they would take over responsibility for structuring the intranet. Librarians 5 and 9 were building the front-end onto the “grid” which was provided from their Service Providers

The ICT co-ordinator in School 2 had started the intranet by putting together a set of homepages. However he stated “about six months ago *the librarian* put together a new set using FrontPage which is a bit more slick and she has taken over responsibility for doing that...” This was after the librarian was given training by the authority. She stated “It wouldn’t be there if it wasn’t for me. I decided that what we had was rubbish and I just decided to take it home and do it all.” Questioned on why she made that decision to get involved she said “I think this job is if you don’t try something you will never get anywhere.” Much of what she has learnt has been through “trial and error” and being “thrown into the deep end.” She spoke of how she had been “useless” with computers at University losing an essay at one point. The deputy head in talking of the librarian described her as being “dynamic.”

Librarian 5 stated “When I came here the intranet had been sitting. It was like a grid. It is really just a collection of files and *the previous librarian* had been working on it to populate some of the pages, but it hadn’t gone live. It wasn’t actually being used.” In making it live

and using it they could start to fill it up as they went. This also involved much restructuring of the grid. Questioned on why the librarian was given this role he responded "she was the only one that was IT literate in computers to do it... the librarian was the obvious choice for administering it." The ICL representative gave them some training. Both librarian and library assistant were sent on FrontPage training but by the time they got it they had already surpassed that level themselves. During a demonstration the librarian showed how he had changed the structure (e.g. use of buttons rather than just name and underline). By taking out many of the steps to get to the subject content this has improved the presentation and organization making it easier and quicker for pupils to use.

In School 9 the intranet came as a package from their Service Provider but sat as a bare grid for two years. The librarian was not asked to develop the intranet. No-one else in the school took responsibility for it. The librarian said of his involvement in ICT "I felt a little bit sidelined when it all started coming in ...I kind of had to muscle in." The pupils were looking at it and not understanding why anything was happening. The librarian had been working on the front-end for several months learning the skills as he went along. "I've actually got a book there I have been working my way through. It is actually something that has been put on my staff development review with *the authority* anyway." However he had recently accepted a post outside school librarianship. Considering that he had only just taken over responsibility for the intranet it was surprising how concerned the ICT co-ordinator was. She was head of Business Studies and a member of the senior management team and was quite clear that she did not have the skills to work on the intranet herself.

School 15 was deliberately included to study which of the more technical roles applied with a longer serving librarian with good ICT skills. The building of the intranet had been completed by the head of Computing, called the Network Manager (NM). Once the front-end with the pathways was set up, departments were given some control. When they have prepared materials, they let the NM know and he uploads the materials to the server. The librarian had no direct access to the server.

Others were surprised at questions regarding this technical role for the school librarian. ICT co-ordinator 11 stated "Well to be fair to the school librarian she is familiar with Filemaker Pro and has set it up for the library but I think that is as far as her technical skills go... If the librarian is going to have a bigger role then I think there is a huge training issue for school librarians." ICT co-ordinator 7 stated "they are not going to be a network manager, but they

are certainly going to be an information manager...They are not going to have to set things up, they shouldn't have to."

7.4.2 Intranet Manager

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
No	Yes	No	No	Yes	No	No	No	Yes?	No	No	No	No	No	No

Table 10. Role of the school librarian as intranet manager

It was considered possible for librarians or other individuals to be responsible for managing the content without having built the actual intranet. The only two librarians who could be described as intranet managers are librarians 2 and 5. A question mark has been put against librarian 9 as the intranet was just not developed enough, with any significant content for it to be claimed that the librarian had the role of manager. However it was clear that it was a role that the ICT co-ordinator would have liked the librarian to keep if he had stayed. The ICT co-ordinator was asked would management of the intranet be a key part of the interview with the new school librarian and responded "I would hope so...I don't think it is compulsory that a librarian needs to know about an intranet and how to do it. It just depends I suppose on every schools decision as to who is going to take responsibility for that. But I don't think it is compulsory but it would be very nice for me."

Librarian 2 said "According to *the ICT co-ordinator* I am the person who is in charge of the intranet." Whilst the ICT co-ordinator considered that "...she has become the manager of all the ICT resources in many ways. And I liaise with her as to how we access resources and how we put things together. But she has taken the responsibility for that." In an email sent six months after the interview the librarian discussed how there had been "big changes happening throughout the authority, - more and more school librarians are being given the added responsibility to manage their schools' intranet, manage access to the Internet (mostly via I-Gear), create and design their school's websites and some are even taking on the responsibility of managing their school's network."

Librarian 5 had the official title of "intranet editor." He had overall responsibility for organization of information on the intranet and for updating all the materials. As this was a pilot for the authority, questions were asked on whether librarians in other schools would be expected to take on similar roles. He considered that it would vary from school to school "I think some librarians would be very keen at taking it on, some wouldn't be keen to take it

on....We have discussed it. Really informally and I don't think anyone would come out and say I wouldn't take this on but some people have pointed to the extra work and they would not be keen on that. I think some of them would be technically incapable of doing it and I think it would depend on the ICT power structure in the school, if you like." He talked of how no-one tried to "hog things" in his school and of how there was "no power struggle."

The depute head talked of this librarian's ICT skills as being "very highly developed" and of his attitude towards the role; "he was very, very keen. He was keen to accept this responsibility and has remained so. And there is something of an evangelist about our librarian in terms of the way he will approach things and see what potential." Asked about whether other members of staff could have taken on this role he replied yes, but at the end of the interview he stated that actually although others were capable of taking on the job, they could not do it due to time. And if ever interviewing for a new librarian they would "without a doubt" want that person to take on the role of intranet editor. Although the library assistant had been given extra hours to do most of the general populating (adding URLs) the librarian had to find time when possible to see to the intranet management. He estimated that he was currently spending between 10 and 20 hours per week on it.

7.4.2.1 Librarians as possible intranet managers

Schools 2, 3 and 4 were in the same authority. The staff interviewed in Schools 3 and 4 appeared aware of what was happening in School 2 (and at least one other school in that authority) reacting positively to the idea of school librarians as intranet managers. For ICT co-ordinator 3 the role of librarian as intranet manager was an obvious choice because "she is the one that most people are likely to approach." Similarly in School 4 the ICT co-ordinator said "The librarian is, well we see her as facilitating access to information on the network. In the same way as she facilitates access to book material." He admitted that they were at "trial stages" but considered that the librarian would be responsible for up-dating material. Librarian 4 was not so positive about the role of intranet manager but agreed that she was in charge of I-gear and the school home page. She was at the stage of getting interested people involved. She was unsure of this role but recognized that the school was expecting her to do something. She considered that she could be more involved if she had more time.

Time was the reason given by school librarian 8 for not becoming the intranet manager "I did think of that at one time but to be honest with you I wouldn't like the workload with it. I

wouldn't have time to do it." Assistant head 8 mentioned that the librarian was on a group which was looking at information to go on the intranet. Head teacher 11 talked of providing a library assistant within the next few months which would allow the librarians "to have more of a role as far as the intranet management and usage is concerned."

Time to get settled in the job was the reason given for librarian 12 not having a role in intranet management. The intranet was managed by the ICT co-ordinator who described the school librarian as quiet but stated "he will also be given a role in the management of the intranet. He does not know it yet...I will let him get his feet settled in his library job, and then. But he is a..(pause) a good pick for a school librarian." The librarian in his interview was keen to be more involved in ICT in the school.

7.4.2.2 Librarians not seen as intranet managers (1, 6, 7, 10, 13, 14, 15)

In response to the question on librarian involvement on intranet management ICT co-ordinator 6 clearly related this to the librarians' lack of technical skills: "In the technical side of things, no. I've been trained, I did do one training, not specific training to overall job of ICT co-ordinator but I felt myself that I need to go off and do some FrontPage." When the librarian demonstrated the grid she talked of the "inappropriate" headings and layout for the library pages but did not know how to change them.

Librarian 10 considered that it would have been useful if she had been given some form of place in this structure. As librarian she considered that she was often overlooked "... He (*the headteacher*) does not think of me as the first person to call on... in the main I find teachers are not the best administrators....I think the role of a librarian should be to do with the intranet, not the things that they all do but to do with proper organisation and dissemination of information."

School 15 had originally formed a group of 6th year pupils who under direction of Computing were to "manage" the intranet. This did not work as the pupils lost enthusiasm and issues of control were raised. The librarian had put effort into encouraging departments to do their own pages. The librarian was not the intranet manager. They had no such term in the school. As stated the Computing staff had overall responsibility for the information on the intranet.

7.4.3 Network administrator: Password / security responsibility

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
No	Yes	No	Yes	Yes	No	No	No	No	No	No	No	No	No	Yes

Table 11. The role of the school librarian in network administration

From School 2 onwards it became clear that a number of librarians had taken on responsibilities for tasks associated with the role of network administrator (Table 11). It should be stated that in no school was the librarian the sole network administrator. There had been no hint that librarians would be involved in this way in the Scottish literature on school librarianship.

Librarian 2 managed I-gear the filter software and had attended a training day for this. The school librarians had been discussing this role via the authority's email system. Not every school librarian has been given responsibility for the filter software and this had led to much debate. She named two schools where librarians had been given this role and commented "But people like *Name* -her school decided that it was the responsibility of the network guy and she was told she wasn't experienced enough and *Name* was quite annoyed about that but at the end of the day she was quite glad that she wasn't doing it. So things like that have very much been left to the rector to decide." In an email sent 6 months after the interview librarian 2 talked of how her job as network administrator had "increased markedly." She was now one of four network administrators and stated "We've also discussed moving the server down here so that I can manage network users accounts (ie delete pupils who have left, change passwords etc)."

School librarian 5, along with the head of Computing and head of Business Studies had a role in "Novell administration and I-gear administration. I deal with pupils profiles and passwords." He was asked to take on this responsibility as a member of the ICT committee and stated "I had no problem with it and the more people that are doing it the easier it gets." The situation in School 15 is similar in that the librarian is now one of three Igear administrators. Mention was made of it spreading the workload. It had been suggested that the librarian take on the role as many of the problems occurred in the library (such as filter software denying pupils access). Librarian 15 stated that he did not consider all the technical tasks he undertook to be part of a school librarian's role. He had recently been involved as a baseline for the school librarian remit. He had been careful not to tell them everything he

did as he was aware that not every librarian could do what he did, and felt that they should not have to.

The other librarian to be involved was librarian 4 who was clearly not keen on this role. She stated that she was “put in charge of I-gear.” This was not something she had asked to do but was “volunteered by my school.” She did not consider that it should be part of the librarian’s duties. “I was interested in it (*the filter software*) on a personal level. Very interested at that level but it’s finding the time to do it.” She related her responsibility with the I-gear software to the reason she was considered to be in charge of the intranet.

7.4.3.1 Negative response to network administration role

No other school librarians indicated that they were involved in any network administration. Few voiced any views on it excepting librarian 8 who responded strongly saying “Ugh. No. No way.” ICT co-ordinator 11 said “I don’t think any ICT co-ordinator in the school would consider the librarian in that way. I think it needs a fair amount of technical expertise which they don’t have. I am not being derogative but...”

Most of the network administration in School 12 was carried out by the ICT co-ordinator himself, although even he did not add users. He could, but he phoned the Managed Service Provider. This was similar to the other two schools in that authority (6 and 9). The ICT co-ordinators acted as the link with the Managed Service Provider. Depute Head 6 (*although not formally interviewed*) spoke to the researcher after the interviews had taken place. She asked what the researcher had found in other schools. On being informed that the previous librarian visited had had a similar role to the ICT co-ordinator with perhaps even more network administration responsibility she expressed surprise stating that she considered the librarian to be “far too important a person” to be involved in the administration of the network. Yet this school was paying an ICT co-ordinator to act as link with the MSP and be content creator for the intranet.

In considering the role of the librarian in network administration it was necessary to look at support services available in the authority. This was confirmed by looking at Schools 7, 11 and 13 who had the services of an ICT Officer (contract technician) for three days per week to carry out many of the network administration tasks. There was absolutely no mention in any of these three schools of network administration as a role for the school librarian.

7.4.4 Technical Support

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Inf	Yes	Inf	Inf	Yes	Inf	Inf	No	Inf	Inf	Inf	Inf	No	Inf	Yes

Table 12. The role of the school librarian in technical support

Inf= Informal

Informal technology support in the library was offered by all but two librarians. Librarians 2, 5, 12 and 15 were the most confident in their responses (ie did not talk of going to ICT co-ordinators for support themselves). With the exception of librarian 12, these librarians gave help outside the library to teaching staff but admitted that technology support could be time consuming. In contrast librarian 12 stated “that is something that I think I will keep quiet.”

The least confident was school librarian 13 “I don’t see that I am well trained for the machinery anyway.” The most that he was able to offer in the way of assistance was supplying the passwords to access the machines. Librarian 8 did not consider that she was asked for technical support.

A number of librarians offered support on “mundane” things (librarians 1 and 14 used this term). Examples ranged from printer problems, access to email, checking that the computers were properly on. Librarian 4 considered that she could fix most minor problems but felt it would be a problem if she had to spend more time on this. Similarly librarian 9 talked of fixing anything minor and also of giving “advice” to staff.

An issue specifically discussed with school librarian 15 was how as an “older” librarian he had been able to take on more technical roles (technical assistance plus network support). His response was that he had been in the school a long time and that staff knew him well. The researcher pointed out that some of his colleagues in the authority had been in schools the same length of time but could not do what he did. He agreed that none of the other librarians in the authority did the same tasks as himself. He stated that he had been given a “free reign” in connection with ICT.

7.4.5 Librarians as content creators

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
No	Yes	No	Yes	Yes	No	No	No	Yes	No	No	Yes	No	No	Yes

Table 13. The role of the school librarian as content creator

Although six librarians have provided some content for the intranet the extent of involvement varies.

7.4.5.1 Limited role in content creation

Three school librarians have provided limited content for their intranets. Librarian 4 had created what will become the front page of the intranet with a picture and school details. The librarian had not gone beyond this to create any linking pages or provide a library homepage although the school expected her to do this.

Librarian 9 created a set of front pages for the intranet which provided school contact details and a picture of the school emblem. He was quite clear that he would not be able to develop much in the way of content as he wanted to work on getting the structure right for departments before he left his post in the next month. It was also clear that he had not considered to any great extent what the content would be but thought that they would probably have a procedure where departments would say "I wish this done." He suggested that this process of collecting information go through the ICT co-ordinator. In building up the structure in the department areas he stated "I think if they have their own area on the intranet they could tailor it more with their own links ...I think the links are the main thing." Pushed on why staff have not made more time to develop content he said "staff have extreme time pressures and there is 5-14 and Higher Still. It is all they can do to attend ICT meetings.....I think it is easier for me simply because I don't have the time pressures." Not all the information provided by this librarian was specific to use of the library. One area he was setting up was the weekly newsletter to pupils.

In School 12 the role of content creator had not been considered for the school librarian. The librarian had started to create his own library homepages. He had to ask permission for web-authoring rights. The librarian thought that the reaction to this was "extremely positive." The ICT co-ordinator confirmed this stating "I gave him a shot of the intranet to see what he could do, and he has done super." Despite the fact that there appeared to be a reasonable amount of content on the intranet it came via the Computing department, with pupil help.

This was the only librarian who indicated any experience of web creation (for over 4 years). During a demonstration in the library he talked of websites he'd created which showed an interest in local history. Following this interest he has started putting archive information on the intranet. The school is coming up to its centenary celebrations and much of the archive materials are kept in the SLRC. The librarian had been scanning photographs of year groups. The librarian has no terminal at his desk but has to wait until a library terminal is free. He spent a small part of the school day working on the intranet but stated "I can see spending large resources of my time on development of materials available over the intranet."

7.4.5.2 Extended role in content creation

Librarians 2, 5 and 15 had an extended role in providing content for the intranet. Librarian 15 did not provide the "flat" content on the intranet as departments had done this themselves. However he maintained a high profile in encouraging departmental use both by example and by seeing possibilities and making suggestions to staff. Where he has created content for staff it was where there was a strong library input. In contrast in Schools 2 and 5 the librarians appear to be the sole creators of content on the intranet. Librarian 5 as "intranet editor" receives all materials, which he then puts into a suitable format for uploading. When asked about staff input into headings /layout etc he stated that he preferred total control due to time. He had previously used pupils for creating content but found they were not committed enough. He set up a "doodles" section of drawings which pupils had done at break time in the library. This added something to the culture of the school and was a way of pupils getting their work displayed. The librarian viewed it as a method of encouraging people to look at the intranet and found it popular with the pupils.

Librarian 2 gave the researcher a copy of her ICT development plans for 2001/2. It included "Development of intranet pages" involving the librarian, ICT co-ordinator and Computing staff. This provided a timetable for intranet development with workload and deadlines. Use was made of pupil helpers in collecting the data. A pupil has also helped in designing the content as "last week I was an employer... with a work experience pupil on web design and we spent the whole week doing the social pages, the extra-curricular and sports clubs." As discussed under the section on resourcing, many of the ideas for content came through suggestions from the librarian, based on her experience of departmental use of the library. In an email she stated

"I receive the material via email; members of staff hand me stuff to put on; kids give me digital camera floppies of things to put on (e.g. latest Cairngorm sports day trip)

or I myself suggest ideas to departments of things to include e.g. we had a "language day" two weeks ago and some of the material generated from that will make a good "mini-web." The Modern Languages department hadn't thought of doing that so it is at times like this that I suggest things and create them for them."

This librarian has become the focus for information gathering in the school. Staff do not need to know how to create the content for the intranet as the librarian can do that for them.

Librarians 2, 5 and 15 have also include information related to literacy support. In School 2 there were reading databases, and Scottish Writers Project material whilst in School 5 there were pupil reviews and poetry pages. Librarian 5 was also setting up a reading club looking for reviews for the "Cool Read" website on the Internet. Librarian 15 had created a senior fiction website.

7.4.5.3 Expectation of others to lead

Although most librarians were positive about providing library information for the intranet a number of librarians when questioned clearly put the emphasis on others to provide the main content. In these interviews there was no evidence that they as librarians had as yet any input into the development of the information or were taking a lead role. Librarian 8 stated "they" are working on library pages for the website which will be the focus of the homepage. At School 11 "interested teachers" were making the website and librarian 11 said "I haven't been asked to do anything about it yet." When asked about the library homepage librarian 7 talked of it being the responsibility of the intranet group. Librarian 13 stated "The *ICT co-ordinator* said he would put a web page up for me but nothing is done so far." ICT co-ordinator 13 had suggested that the librarian could become more involved in web publication and talked of negotiating with the librarian to see what he was interested in.

Librarians 14 needed to rethink what they had planned for the intranet. They considered that they could have had more "personal" information on the intranet than they will be able to put on a website. They gave the example of a monthly health promotion bulletin which they type and photocopy. To save work they would have liked this on the intranet "where people could dip into it." They put lack of software as their reason for not creating their own pages. but felt that they would only be interested in the library pages and that others should provide the subject pages.

Librarians frequently mentioned the library catalogue as something they would like to have available on the intranet (I, 8, 11, 13, 14). A number of librarians had as a high priority

information which could be described as flat content. For example, librarian 1 considered that the handbooks, “Three Year Plans” along with the catalogue “are probably the main things that would be of interest to the staff.” Librarian 11 was also keen to place the handbook on the intranet. But those who had already stated work on their intranets had not included such “flat content” information.

Librarian 3 mentioned using the intranet for book reviews and pupils work. Librarian 11 talked of making new book lists available on the intranet. Librarian 7 took the opportunity in talking of the School Library Service support to show a folder of reviews undertaken by school librarians across the authority to support personalized reading for Higher English students. There was no indication that this type of material would be going on either the school or authority intranet.

7.4.5.4 Where left out but would like involvement

In School 10 the librarian was left out of the group developing web pages. Although this librarian had not the skills to develop content herself it is clear that she considered content to be related to her role.

Some librarians lacked the skills to create their own content for the intranet. Yet librarians 3, 4, 7, 11 and 13 had all had NOF training on FrontPage.

7.4.6 Instructional website developers

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
N	Y	P	P	Y	P	P	P	P	N	N	P	N	P	Y

Table 14. The role of the school librarian as instructional website developer

N = Negative response.

P = Possible. Have not been involved but would consider.

Y = Have been involved in some way in providing an instructional website.

As can be seen from Table 14 librarians 2, 5 and 15 had created instructional websites. Librarian 5 developed one on the use of Microsoft Word. This was done on his own initiative and came from teaching himself advanced Word facilities, which he then felt made sense to do as an exercise for pupils. He discussed making his information skills programme into interactive worksheets rather than having paper sheets to work on. The advantage of having them on the intranet would be that they could be available anywhere and at any time.

However he has yet to persuade teachers to provide instructional websites for the intranet: "teachers aren't keen to have their materials on the intranet you know, their actual worksheets. I've tried to prise them out of them so they would actually be available to the pupils...Information sharing does not come easy to teachers. I think they are also nervous about being scrutinized by fellow professionals."

Librarian 2 created an instructional website for the intranet on the Holocaust. This developed from a conversation with a teacher on a forth-coming first National Holocaust Memorial Day. The result of this website was that a departmental meeting was organized with Religious Education (RE) on how to improve it for next year. RE teachers were now considering other areas which "would lend themselves easily to create instructional websites." The librarian clarified her role by stating "It's very much the case here that the teachers are the ones with the knowledge, content for the pages and I'm the designer, creator. They provide me with the information and I create the webpages in FrontPage." The content of this instructional website is very relevant to the use of the SLRC as it has a strong emphasis on information resources (see Appendix 17 for full details). Not all librarians in this research seemed confident of this.

Librarian 15 had completed an instructional website for his information skills programme using the theme of pirates. He was also developing an instructional website on using the catalogue system. In addition to his own instructional websites, relevant to information skills, the librarian had a role in collaborating with teachers on instructional websites. An example of this was the instructional website on New Lanark. The History teacher provided all the photos and the historical detail. The librarian put it together in collaboration with the teacher ensuring that it fitted his requirements and that they also had links to resources and other references. A different approach was taken in collaboration with a Geography teacher on earthquakes. There the librarian provided the skills training and resources but the Geography teacher put the website together. With the Home Economics department the librarian only provided the training (and no resources) and the teacher then proceeded to put together her own instructional website.

Librarian 15 was working on a major library instructional website entitled "Issues." This was for discursive essays in English and RE and was a cross-curricular effort. Three English teachers and one RE teacher were working with him. For each topic a teacher wrote the introduction. In some topics e.g. AIDS this introduction was very detailed and outlined

various biases which could be met in the resources. An example question was provided which the pupils could choose to research. There was also a set of evaluated Web links. The website included "support" material on how to write a discursive essay for English, how to write an essay for RE, e.g. highlighting the need for a "moral" slant in RE. One section stated what should be included in the way of references. This information came from the teacher and was directly relevant to pupil research. This can be seen as more structured than librarian 15's previous examples of instructional websites. It is more than simply having a resourcing input and has a strong emphasis on information literacy skills. The librarian designed and maintained these pages.

7.4.6.1 Librarians not involved with instructional websites

Four librarians were negative in responding to this role (1, 10, 11, 13). Librarian 11 responded "I hope not" on being questioned on this role. Librarian 1 had not considered it but felt that she would need a lot of training stating "I'd also have to say that I sometimes feel overwhelmed as a school librarian as it is, without additional work... The ICT area of school librarianship is very exciting, but there are limits to what a lone professional can do."

Other librarians were more positive about involvement in creating instructional websites (3, 4, 6, 8, 9, 12, 14). The key reasons given for non-involvement were

- Lack of time
- Need for collaboration
- Consideration not given by others in the school to this as a role for the school librarian
- Skills for putting into HTML format.

No senior management offered a role relating to instructional website developer for school librarians.

7.5 Changes to the role of the school librarian

Only four librarians felt that the intranet had not changed their role (3, 8, 11, 13). Other librarians were surprisingly confident about how the intranet had changed their roles. Librarian 1 stated "It's just changed it so much. I think I am seen far more as a member of a department on my own." She saw it as the way forward for school librarians "I think that there's an expectation that this is going to be a big opening for school librarians to change their image to something a bit more 21st century." She considered that the status of librarians within the authority has been raised "enormously" by IT and added "You know we're seen as being expert to non-expert eyes perhaps." This idea of being seen as an expert when you don't feel expert was reiterated with librarians 6 and 7. Librarian 6 talked of staff thinking it "wonderful" when she was able to help or pass them onto someone who could help. Librarian 7 stated "And I don't think I am an expert at all. I think I know more than I think I know...but I am more expert than some of them." Librarian 6 felt the intranet had changed staff's perception of her and that further involvement would "benefit the library because you are seen as more professional." This perception was also evident in the response of librarian 14. Librarian 9 felt the intranet had "enhanced" the librarian's prestige. Librarian 12 considered that it had changed his role in that he had found "an appropriate thing for me to extend my remit... I think have found something that I think I can contribute to."

Librarian 4 related the change in role to being put in charge of the intranet and the implication this had for time. The head teacher was also concerned about pressure on the librarian's time which came from the "new" part of her job "the front-end management" of the Internet/intranet. He stated "And yet she has still the job of managing the library, looking after her stock." Librarian 6 considered that she spent 60% of her time on ICT now, despite appearing to have low level involvement with the intranet.

Librarian 5 agreed that it was changing tasks. At times it had made him completely re-think what he was doing (eg interactive tutorials). Again the issue of status was raised. The librarian felt that the intranet made the senior management more aware of his presence. He talked of teachers discussing what was available and saying to senior management "oh it's on the intranet. The librarian did it." The librarian also thought that the next interview for school librarian at this school would be very different to his. It has already been mentioned that the depute would want any new librarian to take on the role of intranet editor. Depute head 5 felt that their SLRC "had come an awful long way in a very short period of time." He talked in terms of it being a "surprise element" but "something that has been welcomed."

Librarian 2 gave the most positive reaction to the question on changed role “Oh big time. A lot of people kid on if I am actually reading a book or actually touching a book. They say, “oh look we’ve got the old librarian back.”” She still considered that she did all the “book stuff.” She reported that despite the obvious enthusiasm she had for these new challenges, she was “more stressed ”and went on to say “and the annoying thing is that the stuff that we are doing is great because in the long run you know it makes sense for the school... it is going to help you out.” The depute head and the ICT co-ordinator both recognized that her role had changed. The depute responded “hugely” and went on to say that “any school librarian worth his or her salt should I think have her work changed hugely.”

7.5.1 Impact of the intranet on use of the School Library Resource Centre

A number of librarians felt that the intranet had made little impact on use of the SLRC (11, 13, 14). For these librarians the intranet had yet to have an effect on their role and hence lack of impact on use of the SLRC was not surprising.

7.5.1.1 Increase in access to computers

As intranets are being developed in schools the number of computers available in SLRCs are increasing. Some librarians saw an increase in library use directly linked to the availability of computers (1, 6, 7, 8, 10, 13). For example librarian 1 stated “I get classes in perhaps just to use the Internet that perhaps would not use the library for other reasons.”

Librarians 1, 6, 9 and 11 talked of departments using ICT in the SLRC as it provided better resources than found in the book stock, eg librarian 9: “the Modern Languages book section here isn’t very good but Modern Languages will now send people as we have information on computers.” This greater access to information sources appeared to provide school librarians with confidence that they could meet the information needs of users. Librarian 11 stated “it makes it much more interesting and much easier. I have got all that backup. I don’t have to think in advance. In the past I have had to do newspaper clippings and magazines and I have had to think ahead and try and second guess what kids will decide to do investigations on.” Depute head 5 felt that the presence of the intranet had increased use of the SLRC across departments. He stated that “prior to the intranet, it was very much the province of the English department” and added “I think the library is used much more efficiently now and it’s used by more staff, more departments and more pupils really.”

7.5.1.2 Access to learning

Head teacher 1 suggested that the intranet and access in the SLRC was part of a wider change in access to learning, particularly for senior pupils providing a “more flexible way of accessing learning. ...I see that developing through school library facilities.” This had not yet happened to any great extent in this school but it was clear that “Flexible Learning” was going to have an impact on the SLRC.

Three librarians emphasized the importance of access out-with formal teaching hours (librarians 8, 9 and 10).

7.5.1.3 The need for a SLRC

Librarian 2 was one of the few who felt that less people were coming to the SLRC as more was done electronically. She emphasized that she still used books despite her involvement with computers. There was no indication that the intranet was anything but a positive move. Librarian 5 did not actually state that less individuals were coming to the SLRC but in discussion it was clear that this was not an issue. He gave the example of a Modern Studies teacher requesting information. The librarian supplied the teacher by providing the links but when the teacher used the material later it was away from the SLRC with no librarian involvement. He considered that many departments used his links on the intranet out-with the SLRC. Depute head 5 felt that the intranet has not diminished the need for a library and added “We can certainly see that a lot of the stock that we have got on the shelves needs ditched. I mean that process has gone in tandem with the advent of the intranet but we still want kids to read.”

School librarians did not feel that people would be deterred from using the SLRC due to the intranet being available in the classroom. Access to machines was the primary reason given although librarian 10 rather cynically suggested that it was useful for teachers to send pupils to the library to get them out of class.

ICT co-ordinator 9 stated of the intranet “I don’t think it has made the children use the library any less than they did before.” Assistant head 12 talked of emphasizing to the librarian that pupils should be discouraged from going straight to computers and consider other resources in the SLRC.

There was no evidence from any librarian that the budget for book stock had been cut due to spending on ICT.

7.5.1.4 Increased use

Two librarians discussed an increase in use of the SLRC due to the ability to book access. Librarian 1 talked of being able to give instant answers to email requests from teachers checking whether the library was free. Librarian 2 went one step further with an “electronic booking facility” where staff could themselves check availability. The librarian cited this as a reason for the SLRC being used across most subject areas now.

Librarians were unable to give examples of change of use of resources due to the intranet. The exception was librarian 2 who had found a difference in use of materials for the staff library. These were usually handed to the librarian from a member of senior management. Previously the librarian would have put a note in the staff newsletter saying that these titles were available but “I have now got a page where it lets staff know all the ones that are there and more staff are coming down and saying can I borrow this book.”

7.5.1.5 Increased guidance to pupils

School librarian 2 talked of more staff wanting URLs on their subject websites as they preferred that to having to tell pupils to type in specific URLs.

When putting up curricular websites for departments librarian 5 divided each subject department into age levels. Pupils in S1/ S2 could click on the link for that age group and go to suitable materials pre-selected for them. He stated “I think it has made a big difference in the way pupils get their information and getting information at the right level.” But continued “a big problem is that they download information which is very relevant and bang on and then they just tend to use that undiluted.” This was the “teachers problem rather than a librarian’s problem.” But it was his role to help pupils find appropriate materials and thus provide the “scaffolding” on the intranet.

As the homework site in School 15 has extended to the whole school, URL support is now provided to appropriate year groups. Librarian 15 stated how it is no longer just the URL which is provided but the name of the website (which is linked) with a short description of the website.

7.6 Purpose of the intranet

In the authority interviews it had appeared that there could be a connection with the purpose of the intranet and the role of the school librarian. A number of the librarians identified that there was not one single purpose to their school intranet and that it could be used for a number of different purposes (librarians 2, 5, 9) e.g. school librarian 9 "I think it has multiple purposes to be honest."

7.6.1 Dissemination of information

The most common answer was that the intranet was a tool for disseminating and increasing information (1, 2, 5, 8, 9, 13, 14). Email was a central part of this.

Librarian 2 stated "It's a point where the whole school can connect and access information without having to come down to the library, without having to go to any other departments." For librarians 2 and 5 the use of the intranet was also seen as a way of connecting on less formal but whole school interests- for eg staff current events (librarian 5) and "things like the school show and the sponsored walk" (librarian 2). Use of it for these purposes in School 2 has meant that for the pupils it had become "a kind of notice-board."

7.6.2 To support curricular research

Surprisingly few school librarians related the purpose of the intranet to supporting curriculum research. This perhaps explained in part why few librarians themselves were involved in developing the curricular areas of the intranet. However librarian 5 stated of all the reasons for the intranet "by far the most useful is links to the Internet." Librarian 6, 9 and 12 also talked of the purpose in terms of extending traditional resources available in the SLRC. Librarian 12 said that this was what the purpose "should be." A small number of librarians related the intranet in general terms to pupils learning e.g. librarian 11 stated "That is to facilitate learning, teaching and independent study."

7.6.3 Confused

Two librarians felt that their schools were unclear about the purpose (librarians 3, 10). Librarian 3 stated "A large number of staff don't really have anything to do with it at all. They can't see the point of it." The lack of clarity in purpose was evident in librarian 10's answer, "I wouldn't like to put an answer to that. Because I have my own views that that this whole thing has been produced with no thought what-so-ever about what we are doing with it."

A number of librarians consistently gave confusing answers to a number of questions throughout the interviews, using the term “intranet” when clearly they were referring to the school’s network (eg 7, 11, 13). Librarian 13 was not confident that he knew what the intranet was (had discussed this by telephone with the researcher) and at one point asked the researcher to turn off the tape to clarify the meaning. From the other interviews in this school it was clear that there was indeed an internal intranet although at very early stages and this librarian also had access to an authority intranet which he made little use of.

7.7 Influence of School Library Support Services on the school librarian’s role

All but one group of school librarians (Authority E: Schools 2, 3, 4) considered that their School Library Service or Education Library Advisors had not been involved to any extent in the formal development of intranets in schools. None of the three school librarians (7, 11, 13) from Authority C, referred to the Internet Policy developed by that authority’s School Library Service when questioned about intranet policies. Despite the presence of the School Library Service in Authority C none of the three librarians interviewed discussed meeting with other librarians.

In Authority B librarians 9 and 12 both mentioned the visits to school libraries which were part of the library advisor’s policy for supporting the school librarians. The visits were important for a variety of reasons:

- meeting fellow librarians
- being shown other school libraries
- seeing examples of good practice.

Librarians 9 and 12 (and ICT 9) mentioned one specific school which they had visited where the librarian was seen as leading ICT development. This informal contact with the wider school library community appeared to be helpful to individual school librarians in promoting their use and development of technology. Librarian 1 talked of informal visits to help on aspects of training in the use of the technology whilst librarian 2 (who appeared to be more technically capable than many) still voiced her need for support by email or phone: “I think if I didn’t have the help of the School Library Service I would feel as though I were floundering, or if you think about it I am isolated.”

Authority E appeared to be the exception in their support for intranet development. This authority like the others did not have a specific intranet development group or intranet policy

for school librarians. However the School Library Service has become a focus for intranet development through their virtual library service and expert librarians chosen for different curricular areas (see also Appendix 18). The teaching staff interviewed in Authority E were all aware of the librarians' role as subject specialists and appeared to be in support of that role. In School 2 the deputy head talked of the Physics department identifying web links but then went on to discuss their librarian's role as science subject specialist across the whole authority so that "not everybody has to discover the web pages for themselves."

Due to internal re-organisation the curriculum officers at authority level who had liaised with the school librarians were removed from post and at the time of the interviews the librarians were not sure what was going to happen to their role as subject specialists. Since the interviews the school librarians have continued to play a lead role in their "virtual library." Two school librarians have been seconded part-time to develop this site. What has changed is that information on the website now covers suitable curriculum materials for the primary schools. Librarian 2 wrote "we decided that where there is a lack of good websites available on the Internet for particular subject areas, we'll create our own instructional webpages to make up for this lack (ie it's very hard to find good websites on "transport" that would be useful for primary schools and, seeing as most primary schools have a lot of good material on paper-based projects for this topic, we plan to use this information to create relevant, useful and effective instructional websites for them)." (Email from librarian 2). This put the librarians in the role of creators of web content not just within the school but across the authority. In their role as subject specialists the librarians were given FrontPage training. They were also given freedom in what they did within their own schools. Librarian 2 stated "It's been very much left to your own devices." School librarian 2 did not consider that the School Library Service could have done more, except perhaps provide auxiliaries to help the librarians. For this librarian the freedom to develop her own intranet was viewed in positive terms. Other school librarians were not so certain.

What school librarians wanted from School Library Support Services were

- More guidelines (4, 5)
- To see examples of what other librarians were doing (7)
- To be informed of new developments (8)
- More training (1, 10)
- Money and status (1, 10).

7.8 Future Role

Although many school librarians saw themselves continuing to be more involved, it was generally in ways already defined in the above breakdown of roles. Librarians 2 and 5 talked of expanding their instructional web creation roles. Although librarian 8 saw herself becoming more drawn into the intranet it was in the collaborating side and in developing pupils ICT skills, two aspects of the role that she was already interested in out-with the intranet (but not jumping to managing the intranet or the more technical roles).

The one exception was librarian 12 who as has been mentioned was to be given a role in management of the intranet and in teaching ICT to pupils and staff.

In general the responses from senior management and ICT co-ordinators implied that future involvement of the librarian would be within areas of interest already defined.

7.8.1 Facilitator

The greatest number of responses included the term “facilitator,” “helping” and “advising” Since many had talked in terms of the librarian already having a tutorial role, this implied no great change. Head teacher 11 stated “I would see the librarian’s role very much to be to work with individuals and small groups.” There was less evidence in the ICT co-ordinators’ interviews of an understanding of this type of role.

For some librarians the “facilitating” involved more than access and tutorial support eg for librarian 9 it involved “maintaining the presentation of the site and the information content.” Librarian 2 referred to her future role as “information manager.” ICT co-ordinator 3 talked of a gradual evolving role where the librarian “would take on more the role of facilitator and co-ordinator of ICT or whatever.” This implied a more central, perhaps leading role than currently undertaken and explained why although he considered the librarian to be “willing,” it would require extra training and support. This view of the future role was also given by head teacher 7 who considered that the future library would be seen a “learning centre and I think the kind of person who will be a school librarian will change in the future. It will be somebody who can facilitate access to all the various media of information...” Again training would be needed.

7.8.2 Proactive librarian

Depute head 2 considered that once they were able to provide the librarian with an assistant she would be able to go out to work with more departments. It was a role that the librarian has started and is an advance on simply waiting for departments to come and ask for advice.

Librarian 8 also discussed her future role in similar terms of “actively going out and improving and setting up opportunities for pupils to improve their ICT skills.” The difference between librarians 2 and 8 is that librarian 2 will host all the work she develops on the intranet, librarian 8 currently on the network. And whilst librarian 2 will create instructional websites for the intranet, it was not clear that librarian 8 will do this but rather expected teachers to use her information sources and suggestions to do this themselves.

Librarian 12 felt that any future role has to be “something that is done across the school in partnership because it cannot be something that the librarian does on their own.”

A number of librarians referred to the difficulty of collaboration in talking of their future role (eg 11, 13). There was little in either interview to suggest that they currently worked collaboratively with teaching staff (e.g. not working with staff on information skills, talked of lack of involvement in planning for research projects). Librarian 11 was already preparing materials but on her own. Librarian 13 stated that a future collaborative role should “stop me being a librarian.” Librarian 3 talked of working on the intranet “on my own basis” because of the difficulty of collaboration.

7.8.3 Other roles

As mentioned earlier librarian 5 discussed becoming more involved with general school administration information on the intranet. This would mean working closely with the administration staff.

Librarian 4 considered that the future could mean spending less time explaining basic information and keeping staff up to date as this would be done via the intranet.

7.8.4 A matter of choice

Librarian 12 argued strongly that it should be a matter of choice “If this is a role that they are going to take then I think it is really important that it’s voluntary.” Showing his enthusiasm for the intranet he described himself as “interested, “desperate to get an interest in” and “it

is something that I really want to do” but also talked of how librarians are expected to do a “great deal” and understood that not everyone would be interested. As previously mentioned librarian 5 and ICT co-ordinator 9 had also mentioned that not all librarians would want to take on intranet roles.

7.9 Future Education

All those interviewed were asked what skills they considered should be included in the future education of school librarians. Assistant head teacher 14 and assistant head teacher 8 were both unwilling to answer this question.

7.9.1 ICT Skills

Almost without exception all expected librarians to have good ICT skills. Most talked in general terms of an "awareness" of ICT, a "familiarity" with technology. Not surprisingly many mentioned Internet searching and the ability of librarians "to direct" people to resources.

Two librarians provided details of more technical skills which they considered school librarians should have: PowerPoint, Microsoft Image Composer or Photoshop (librarian 2) and ability to use an HTML editor, knowledge of file structures and web design skills (librarian 5). These are very relevant if school librarians are to be designing and creating content for intranets. Librarian 5 mentioned network administration skills. Surprisingly librarian 9 did not mention more detailed technical skills stating that Managed Service Providers will be giving schools the structure of their intranet (but not all schools have full Managed Service Providers). Neither did he mention the necessity of HTML skills although he previously talked of trying to get on a course for this himself.

Librarian 13 talked of the need for “typing skills.” This indicated his own lack of confidence and knowledge with ICT.

ICT co-ordinators talked of a range of more general ICT skills. ICT co-ordinator 12 and assistant head 14 mentioned familiarity with packages such as Microsoft Office. Assistant head 14 mentioned their library software. ICT co-ordinator 12 talked of the need for technical support skills "some sort of technical capability to resolve simple difficulties quickly." ICT co-ordinator 7 discussed the need for librarians to have an understanding of

databases. ICT co-ordinator 11 initially reticent to answer, talked of the possibility of network skills, even web page creation skills.

7.9.2 Educational skills

Generally there was far less mention in the responses to what could be termed educational skills.

Depute head 2 and school librarian 2 talked of an understanding of learning and teaching. Librarian 2 discussed learning theories and the different ways pupils learn. This can be directly related to the fact that she was working on the school's draft policy for learning and teaching. There was no strong feeling that educational theory was a real lack in any school librarian's education and that there was a need for change in the education system to include this. Librarian 11 referred to the fact that North American and Australian school librarians were teacher qualified but she did not feel that Scottish librarians needed to be. Librarian 9 stated that school librarians were already instructing pupils on how to use the SLRC and CD ROMs, and that it did not require an additional skill. Librarian 15 pointed out how he had build up his educational knowledge but he did not know all details of the curriculum, that was the teachers' job.

Head teacher 13 identified that librarians "Need to be aware of what knowledge, skills, dispositions, are expected of youngsters in the curriculum." Assistant head 8 was typical of a number of teachers as he talked of the school librarian's ability to "help pupils with their research, be a support" and to be "involved in the curriculum."

Only librarian 8 felt strongly about the need for teaching skills which she stated was a "huge" part of her job: "They don't expect a teacher to come into school and teach a class without training." There was no indication in the assistant head's interview that this was an area that his school librarian lacked in. Librarian 5 after discussing the skills added "but the real learning starts when you take up first post."

Head teacher 6 referred to library skills in "monitoring" the machines and knowing what pupils were accessing. This can be related to the "supervisory" role and the emphasis he placed on the librarian "booking" people in and out of the computer suite.

7.9.3 Interest in Young people

Several of the interviews mentioned the need for librarians to be able to relate to young people. ICT 12 considered that librarians should have an “interest in young people, teaching kids.” Head teacher 13 talked of the need for school librarians to have “trust” and “to be able to establish positive relationships with young people.” The head teacher in School 3 was very forceful about the librarian’s ability to relate to young people “There has been a culture that libraries are about books and things, the key thing is the relationship with young people.” He added that “if librarians are not comfortable with groups of young people in the library then their career needs to be changed.” This head teacher was talking from personal experience from working with a previous librarian. The depute head in School 5 was equally forceful “And certainly someone who likes pupils and that is a sine quo non of the job.” This was important not just for the formal contact during class time but essential for the extra contact times that many librarians have with pupils as evidenced in School 5 where the librarian ran “clubs at lunchtimes and after school” (depute head 5).

School librarians themselves did not mention relationships with young people.

7.9.4 Communication skills/Presentation skills

The terms of “liaising”, “coordinating”, “dealing” and “communicating” with individual staff and departments appeared frequently in many interviews and were identified as necessary skills by school librarians, senior managers and ICT co-ordinators. There was also the suggestion in some interviews that these skills were new and will be increasingly needed in the future (librarians 5 and 7). A typical response was that of ICT co-ordinator 3 “I think they have, if it develops the way we have been discussing, then they have to liaise, a lot of their time will be spend liaising and on advising heads of departments.” Librarian 7 related team teaching to the skills question as the way forward. The head teacher in School 7 also discussed co-operation “I think there will have to be a lot more, maybe more intervention, maybe more closer contact, closer with the librarian and teacher/pupil.” Librarian 15 considered that good relationships with teachers was important as teachers need to be able to say what they require.

Librarian 11 considered that a formal course in presentation skills should be included in the training of librarians. School librarian 10 talked of the need to promote the SLRC and make staff aware of the role. The head teacher in the same school stated “they need to be good at

PR at what they themselves are offering... in terms of what is different in what they are offering.” Only librarian 8 mentioned using in-service to promote their role.

Librarian 5 saw a need for more formal skills which come from presenting development plans, using performance indicators and bidding for finance. Depute head 5 talked of the confidence of the school librarian and their “ability to work with departments” and to “suggest other ways of doing things.”

7.9.5 Information Management skills

Very little was said of what could be termed traditional library skills. ICT co-ordinator 4 mentioned maintaining library stock whilst librarian 5 gave more detail “basic library skills, cataloguing, admin, budgeting, knowledge of stock, buying.” Assistant head 8 stated “to be able to do everything in the library.” There was an assumption that these are necessary but not an issue.

7.9.6 Flexibility/ Willing

These were two terms which surfaced in many of the interviews of ICT co-ordinators and senior managers. Head teacher 11 made the point that librarian’s were in a “unique” position in a school in that they were free from much of the classroom contact and could therefore interact with pupils in groups, or one to one, in a more “flexible” way than perhaps teachers in the classroom: “for a lot of kids that is a good way of learning and a good way of passing on information, passing on knowledge.”

But he also talked of flexibility as a necessary quality for the school librarian, that she is “willing to try out new ideas.” This concept of openness to new ways of working, especially with technology, was repeated in other interviews: ICT co-ordinator 2 stated “I mean the librarian is very efficient and effective because she seems to embrace new methodologies in a way that not other people do... It really is a willingness to actually explore and to take on board the changes that are happening.” ICT co-ordinator 3 stated “if the library is going to develop along with the intranet, willingness is half the battle.” Head teacher 7 said “A kind of flexibility... But the ground won’t stand still for librarians. Change, helping teachers and pupils adapt to change.”

Willingness was also discussed in terms of “helpfulness.” ICT co-ordinator 3 stated “We are very lucky we have a librarian who is willing.” Depute head 5 previously talked of the

librarian who “will go out of his way” to run clubs at lunchtimes and one of the qualities he mentioned was “certainly a kind of helpful demeanour.” Head teacher 13 put it rather more strongly saying “a desire to serve.”

7.9.7 Ongoing training

Many current school librarians have worked for some time and have seen a great deal of change. Ongoing training was mentioned in two interviews (ICT co-ordinator 4, head teacher 7). Neither offered a solution but as head teacher 7 stated “Now I wouldn’t know how well their current provision of training is developing, but there is a substantial need for more.”

Librarian 11 mentioned the need for refresher courses for those who have left librarianship and would like to get back into the profession, particularly in terms of ICT. Although ICT skills were not a concern for schools employing new graduates, they may be an issue for older librarians.

7.10 Conclusion on role of the school librarian findings

It is clear that there are a variety of roles for the school librarian in Scottish secondary schools. These roles are in advance of the expectations of those interviewed at the authority level in the research. Evidence has been found that librarians have taken on management roles and content creation roles as suggested in the literature. But it also appears that in some cases the librarians have taken on more technical roles of network administration and some technical support. The immediate assessment is that this comes from the interest and skills of the school librarians (individual characteristics) but there may also be a growing expectation from some school management (organisational factors) that librarians should take on these roles.

Librarians have voiced concern about the need for information skills with the increased access to ICT by pupils. It can be seen that the advent of technology in some of these schools encouraged them to re-assess ICT skills for pupils (e.g. School 9 - whole school information skills appeared at time of network- others seen need for information skills). This had a knock-on effect in some schools as the libraries lost part or all of their information skills input (e.g. 9 and 14). But it also seemed that some librarians (e.g.2 and 12) were choosing to decrease their “formal” information skills classes to become more “project” or curriculum based. There was evidence of “tutorial” support recognised by others in the school. Those who are actively using the intranet do appear to be extending their role in information

literacy support. It is not only through resource provision (evaluated URLs) but in the provision of more structured learning opportunities, through guidance on how to search, through age appropriate materials and through instructional websites. In doing this school librarians are extending their educational support role within constructivist learning.

8 Theory development

Through the grounded approach the ongoing analysis sheets were used to make causal statements in relation to each individual case, as schools participated. These were then compared with previous schools looking for patterns. By constant questioning of the causal statements and adding “conceptual terms” to describe the events under investigation, a grounded theory emerged which will now be displayed through the “story” (Strauss & Corbin 1990).

8.1 Developing a school intranet

Firstly it is necessary to return to what the first stages of the research had indicated. The questionnaires had shown a lack of strategies for supporting intranet development and a lack of detail on content. In both the questionnaires and the authority interviews it appeared that a school intranet would be left to individual schools and that authorities had no plans to detail how to develop an intranet or what it should include. The authority visits had indicated that authorities were taking different broad approaches to provision of the technology as the focus was on different uses. Table 15 outlines the key differences in the two approaches to intranet development.

1. Curricular intranet requires	2. Communication + administration requires
Training of teachers in ICT in relation to teaching and learning	All staff to be trained in email + the network
	Building confidence in administration use (less paper use from the authority)
Access to computer suites	All staff to have access to a computer in the classroom
Expectation of external support in supplying materials for intranet use.	Centralised authority curricular support

Table 15. Approaches to intranet development in schools

The curricular intranet came from authorities which were putting resources into schools’ own intranets (Schools 6, 9 and 12 came from one of these authorities). The communication intranet came from the authority which had put resources into an authority intranet which all

schools could access (Schools 7, 11 and 13 were from this authority). It was then left to schools to develop their own intranets if they wished.

It can be seen that the key categories identified were access to computers and staff training. These categories will be investigated first in relation to what was found in practice in schools.

8.1.1 Access to computers

School 2 was strongly in favour of teachers having a computer in the classroom. As this school had a growing intranet which was being utilised by more and more departments, it appeared that the question of access was important. This was re-enforced in School 5. In both schools take up of the intranet for curricular purposes was good with positive reaction by staff. However in neither school did those interviewed give access to computers as a direct reason behind their intranet development.

By comparing School 2 with the others (3 and 4) in the same authority, the two key differences of classroom access to computers and internal training were immediately noted. Schools 3 and 4 appeared to fit the curricular approach by opting for computer suites. The computers had been put together in laboratories to meet the curricular needs of the schools. The priority was in using ICT to support subjects which required them for the new Higher Still courses. Yet other schools also must meet the needs of these courses. The consequence of suites in these schools was limited access by teaching staff across the school to computers on a regular basis. At the same time there was little in-school training and low use of email. What was noted in these schools was that teachers were not supportive of the intranet, were not convinced of the value of the intranet nor of what it could provide. Suites appeared to be a disadvantage for expanding use of the intranet as it does not encourage individual staff outside the main technology departments to use ICT. And nor does it support a culture of internal encouragement.

It was necessary to check whether access to suites had the same consequence in other schools. Schools 6, 9 and 12 had the same RM intranet package and authority policies for where computers should go. Although this policy was to put computers in suites, it became evident in this authority that this was a changing situation and would continue to change as schools acquired more computers. Schools 6 and 9 appeared to fit with lack of internal encouragement for the intranet but in School 12 there was evidence of a positive attitude to

the intranet despite limited staff access. This may partly be explained by the fact that they had had longer access to the intranet than Schools 6 and 9. Yet Schools 3 and 4 had had access for similar lengths of time as School 12. Limited teacher access to computers could not totally explain lack of intranet development.

School 1 had also gone for computer laboratories with teachers accessing computers in staff bases. Not all teachers had a computer in their classroom and they therefore should have belonged to the curricular approach. Yet according to those interviewed (and evidence eg minutes sent by email, the librarian using email to contact staff and pupils), there was clearly high email use in the school. The responses also indicated regular use of the Internet by staff. From the staff questionnaire it can be seen that they were interested in increasing their class use of ICT and looking at other methods of gaining access via the wireless classrooms. The development here, although instigated by the questionnaire and the ICT group, was being encouraged by the needs of the teachers in the school, despite lack of access to an individual computer. As with School 12 the intranet was talked of in a positive light and there was evidence of a culture of internal encouragement.

Schools 11 & 13 should have fitted the communication approach as the authority had stated that computers must be in every classroom. Logically it appears important that if the intranet were to serve the communication and administrative purpose, teachers should have access. Yet despite this access librarian 7 talked of being unable to email staff within the school. ICT co-ordinator 11 stated that the intranet was not a priority although the network was and pointed out the lack of opportunity teaching staff have to check email during the day even with a computer in the classroom. What became clear in these schools is that despite authority intentions, the practicalities of teachers having classes all day, meant limited opportunities to use computers for email. Hence the nature of a teacher's working day will define to some extent the ability to access the computer. But clearly this is also not a fully sufficient explanation. Every teacher could be said to face such similar problems. What can be said is that the technician stance of providing access to a computer does not mean that regular use will follow. In contrast to School 1 there was no evidence of encouragement from within the school for the intranet. There is now growing evidence that for an intranet to develop, there must be an internal need for the intranet whilst part of the explanation may also lie with the other main issue mentioned at the authority stage, internal training.

8.1.2 Internal training

The other theme identified from the authority stage had been in relation to training. Schools 3 and 4 as mentioned had done little training and along with School 6 appeared to fit the curricular approach with low in-school take-up of the intranet. Schools 7, 11 and 13 should have had a great deal of in-school training as they were the schools which were expected to be part of the communication approach. Although there had been some training from the authority as a NOF provider, significantly none of these three schools had provided their own in-school training. In the interviews in School 7 it was mentioned that training had been slow, but otherwise lack of training was not an issue which schools talked of as needing to be addressed. There appeared to be no demand from within these schools for training adding to the notion of a culture which lacked internal encouragement.

The analysis of training appeared to indicate a link between a low level of training and low interest in the intranet. The schools where there was training on more advanced software such as PowerPoint reflected that staff had attained a certain level of ICT competence. These advanced schools made use of the network (eg 14) or intranet for training notes (eg 2, 12) and displayed evidence of ongoing needs analysis of staff (1, 12). These schools would appear to have a supportive culture. But this explanation did not work in every school.

In Schools 1 and 2 the internal training discussed was a key positive issue which appeared to have an effect on the use of ICT in the school. As those responsible for the intranet (the ICT co-ordinator School 1 and librarian in School 2) were very involved with this there did seem to be a connection. However this cannot be said of School 5 or School 9. In School 5 which had a well used intranet there was no internal training within the school at all. School 9 on the other hand had completed some internal training but it had not involved the librarian who was solely responsible in working on and pushing the intranet. Staff in that school were not showing much interest in the intranet, despite their training.

8.1.3 Strategies of mutual encouragement

Key points from the analysis in relation to the schools who were positive about training was that it was often informal, when required and ongoing. The emphasis was on training where there was a need in the school. School 1 had talked of "shared expertise" and displayed a culture of encouragement amongst their staff. What was clear from School 1 was the positive attitude from staff towards ICT. In School 2 the lunchtime training sessions which

included the librarian can be seen as an informal strategy for sharing expertise and knowledge. These appeared as central for encouraging ICT and building up staff skills.

Although this has all encouraged good ICT use in the schools, is it possible to say that this in itself contributed towards intranet development? In School 1 the answer would have to be no. There was evidence of classes using the Internet for research, of teachers using specific CD ROMs for learning situations but curricular support on the intranet itself was limited. Outside Computing, departments in this school did not contribute their own worksheets and support materials. This suggested that the presence of internal training and mutual encouragement, all evidence of a supportive culture was not enough to take them to a higher level of intranet use.

Again School 5 stood out as in addition to no training they did not provide evidence of strategies for "mutual encouragement." Yet the depute head talked of the "receptiveness" of staff and the ICT readiness of the school. Schools 3 and 4 also lacked evidence of such mutual encouragement amongst teaching staff. But in contrast in these two schools there were statements indicating negative feelings amongst staff towards the intranet. There was clearly no "negativity" towards the intranet in School 5. Although it appeared that regular internal training on more than basic ICT and a culture of "mutual encouragement," was beneficial to ICT development these do not fully explain the schools which have developed content on their intranets. There may however need to be at least a positive attitude and a receptiveness towards the intranet which suggests a culture which is open and willing.

8.1.4 Curricular approach

By returning to look at the schools fitting the curricular approach other common categories were sought for further development.

The authority interviews had indicated an expectation of external support for content with low expectations that schools were ready to supply their own materials. Within the curricular approach this appeared to be the case as senior management in Schools 3 and 4 emphasised the "curricular" purpose, teaching and learning. Head teacher 3 in particular talked of the role of the government to provide quality content. In School 6 they were using computer laboratories, and emphasised the use of Successmaker in the Maths department (an externally purchased learning package), and were just on the point of working on their RM intranet package to make it more applicable to the needs of their school. It may be that over

time these schools may have successful intranets. But whilst the emphasis is on external materials, only the limited few departments using these will see the intranet as relevant. What is lacking is an in-school curricular focus. These schools can be seen to have a directive strategy with ICT where the management supports established and proven curricular initiatives (eg Successmaker) but appear indifferent to the possibility of encouraging creative content in the school. Without the internal focus, the take-up and interest in the intranet across the school is slow.

8.1.5 Communication approach

Schools 7, 11 and 13 belonged to the authority which had placed emphasis on the intranet as a communication and administration tool. They were at very early stages of school intranet development (despite having the capability of building an intranet for almost two years in at least two of these schools). The authority intranet officer had emphasised the authority plans to save on administration and cut down on the paper flowing about schools. This authority view can be seen in that two of these three schools also emphasised the need to cut down on paper when talking of the purpose of the school intranet. This did not appear in the responses of other schools studied. Although School 13 had a particularly strong interest in administrative use of the intranet they and the other schools were all keen to see curricular use. And it was for this reason that they looked at developing their own intranets.

Despite the authority emphasis on administration it became clear that Schools 7, 11 and 13, just as all the other schools in this research, would have to put effort into developing administrative content relevant to their school on their own in-school intranets. Further than School 13 who talked of involving administrative personnel in the discussions it was not clear that they had any strategies for doing this.

What became apparent in looking at the authority intranet is that the schools were not in a position to contribute material to the authority intranet and that the key individuals interviewed were not using it for curricular support. The only evidence provided of the value of the authority intranet to classroom teachers was the use of ICT training materials and knowledge of in-service courses. Head teacher 7 mentioned HMI reports, whilst head teacher 11 also talked of management material on the authority intranet. But the ICT co-ordinators and librarians were all lacking in examples of what they used the authority intranet for. There was a suggestion that the information on the intranet was of more value to the administration staff and senior management (by ICT co-ordinator 7). Without

interviewing administration staff themselves, this could not be verified. Head teacher 11 talked of wanting to encourage teaching staff to get into the habit of checking the authority intranet for items like the Draft Service Plan. The point is that this type of information although of value to teachers will not be required on a day-to-day basis. That content is likely to be more relevant to the needs of senior managers. Because teachers do not consider there to be material relevant to the classroom it is unlikely that they will use the authority intranet frequently throughout the day.

The other point to be made is that senior managers and administration staff are unlikely to have the same access problems. It is easier to have the computer accessing the authority intranet without pupils to supervise. What became apparent was that without curricular support there was not a strong relationship between the needs of teaching staff, librarians and the authority intranet. Therefore the necessity for schools to build their own intranets to meet these internal relevant needs. These schools despite the authority intranet were no more advanced than the intranets discussed in Schools 3 and 4. This indicated to the researcher that the presence of an authority intranet in itself, although fulfilling authority administration and communication needs, was unlikely to support an individual school in the same way as their own school intranet. The real development must come from the individual schools. The communication approach as it stands is appearing less distinct. And with classroom access to computers these schools do not fit the proposed curricular approach either.

As stated earlier there was little evidence of enthusiasm from staff in schools 11 and 13 (as in School 3 & 4) whilst ICT co-ordinator 11 did not view the intranet as a priority. There was no sense of urgency within the schools to use the intranet for the curriculum and administration. There was however one major difference between Schools 7, 13 and Schools 3, 4. It can be seen that in Schools 7 and 13 there were individuals keen and willing to take on intranet development. The ICT co-ordinators in both were clearly identified as having a role with the intranet. What needs to be investigated further is why it was not taken up more on a school wide basis.

In tackling the comparisons it has become clear that the way of looking at the intranet through the use of the curricular and communication intranet approaches is inadequate. Schools which should in theory fit the communication approach are found in practice to be more like the curricular approach. The differences between the two have become less clear-cut. And some schools appear to fit neither. They now require further discussion.

8.1.6 The diverse approach

Although Schools 1, 2 and 5 had talked of the curricular purpose of the intranet there was less emphasis on this as the sole purpose. Unlike the other schools they discussed various diverse purposes to the intranet including curricular uses and dissemination of information. Extra curricular material was mentioned in School 2 (eg school show, school trips). This was not something which the librarian had intended when the intranet was started, but it was something which pupils in particular were keen to use the intranet for. Depute head 5 also raised school ethos as a purpose which they had “found,” indicating that this was not something which they had intended or expected in their use of the intranet but something which had emerged through use. Librarian 5 talked of pupils being enthused and motivated by the intranet and gave the example of putting up the “doodles” art work found in the library. It was not part of a plan to do this. The pupils are a specific group of users of school intranets. It is important that they also are considered and encouraged to use the intranet. By placing pupils own work on the intranet pupils are given some form of connection with intranet content. What can be seen here is that although not specified as a strategy by either librarians 2 or 5, attracting pupils users by placing appropriate content on the intranet, is a way of encouraging expansion of the intranet. Pupils are keen to see what is new and relevant to them. What it also does is start to give the school intranet a “community” feel as the content becomes personalised and says something about the culture of the school. This could be seen in School 12 with the archive materials to celebrate the school centenary and in School 5 with poetry and art pages. In School 2 the different PowerPoint presentations of the school show and clubs clearly said something about the school culture. What was noted in School 2 was that the intranet had allowed them to go beyond uploading photographs and there was now a strong demand from the school population for the more active presentation software. This changes the intranet making it more active and lively. The intranet is now being used by these groups to promote their activities, to push information to the school community. The demand is from the users.

School 5 discussed further purposes and potential uses such as administration, which they had not fully exploited. This again provides evidence of the intranet as an “emergent” technology which can support a range of community needs once it is adapted by that community.

The key characteristics of this diverse approach are

The emphasis on a variety of purposes

That new purposes can emerge

The purpose of the intranet is clearly something which can be adapted by schools whatever the intentions of authorities. In reconsidering the above data it was decided that it would be more appropriate to look at the data from a stage perspective. This would apply to all schools. The key uses of a school intranet were identified as follows:

1 (eg Schools 3, 4, 11)

Email/ Internet use

Slow development of intranet content due to lack of priority

2 (Schools 1, 6, 7, 9, 12)

Email/Internet use

Expanding purposes- curricular - but limited departmental use.

Evidence of desire for the intranet coming from internal needs/ receptiveness of staff

Individuals willing to take on the intranet

3 (Schools 2, 5)

Expanding purposes- for the school community

Intranet content gathering due to

Creation of material from within the school

Interest from pupils and teachers for content

4 (School 5 not yet at this stage, but interested)

Expanding purposes- administration?

It is suggested that the value of the intranet is in the relevance of the content. Intranets start with little content. The question of where the computers are located is not sufficient on its own to explain intranet development whilst working practices may be an issue. Rather than training the category which appears to be significant is internal need. It is now necessary to return once again to the beginning of the research in schools and look at other issues which appeared significant.

8.1.7 Culture of the school - Schools as ICT leaders

School 1 had clearly demonstrated a willingness to be involved in projects/research, particularly ICT related projects (eg involvement in Pedactus, willingness to finance and try the wireless computers). The head teacher's involvement in national initiatives (eg TVEI, Higher Still) had instilled a desire to be at the forefront of educational developments. They talked of being a leader in technology (eg reference to the fact that there was no schools in Scotland to look at with intranets, communication with Australian schools, competition to be leader with other school in their authority). This was a very significant factor in explaining where this school was in terms of technology.

School 2 was also recognised as a technology leader but it was pointed out that this was a recent phenomenon. There was not the same evidence of involvement in national educational initiatives as in School 1. They had more cross-curricular materials on the intranet and were at the higher level of intranet use. From the causal statements of what was happening in this school this "culture" within the school explained a willingness to use ICT and experiment with ICT but it did not explain how the materials got there in the first place.

Of the other schools in this research only School 12 claimed to be recognised as a leader in technology. Other schools involved in ICT projects had not gone far with their own intranets (eg 8 and 10). School 5 had no history of involvement in ICT projects, yet it had one of the most developed and well used intranets. Therefore it is argued that a history or culture of ICT involvement was not essential to developing a successful intranet.

It might have been expected that the schools with access to networks and email for the longer time would all have been further advanced than schools which had recently acquired intranets. This was not shown to be true. This reinforces the notion that it is not simply having the technology available in schools which is important.

8.1.8 Senior managers as drivers

The intranet technology in School 1 had been made available in the school at the insistence of the head teacher as essential in the building of the new school. He was the driver behind the intranet and provided evidence of a directive culture within the school. Schools 2, 3 and 4 in comparison had developed their intranets based on the network solutions provided by their authority. In the most successful of these three schools it did not appear that depute head 2 nor any other member of senior management were essential to developing the

intranet. In School 2 it was the ICT co-ordinator and librarian who were responsible for the technical aspects, but this was non-directive and did not come as something instigated from the top. The other leading schools were studied to consider whether senior management support was critical to their developments. From the findings section it can be seen that there was little evidence from the other schools that senior managers displayed the same drive as head teacher 1. There were plenty words of support for the intranet, but little evidence of actual "driving." Also it has to be considered how successful head teacher 1 was in contributing to the build-up of content. He supported the intranet by encouraging use across all departments and by seconding a teacher to develop some administrative work which is intended for the intranet but generally the detail of content was left to Computing. And they in turn had not put effort into encouraging departments to contribute.

It was the contrast in School 5 that highlighted the fact that despite many head teachers flagging up proactive support, it is quite possible for intranets to be developed without real encouragement. Senior management in School 5 were not knowledgeable about the intranet which was given to them as an authority pilot. But as a pilot school they were supportive of the intranet. In this school it was the librarian who has pushed the intranet, working on content and attempting to get contributions from others. In School 9 there was little interest from management, yet the librarian was able to take the intranet forward. What both these schools indicated (and was stated by depute head 5), was not lack of support for ICT development from senior management but lack of awareness of the possibilities of the intranet. This suggests that intranet development is dependent on individuals working from a bottom-up approach. General support from senior management may be helpful but there need not necessarily be directive support for an intranet to flourish. In other instances in this research it is the authorities, not the senior management who could be described as the drivers, as they have provided the intranets.

There was a suggestion in two schools that it would help if senior managers encouraged use of the intranet by using it themselves (1, 5). Although "helpful" the evidence suggested that support by senior management whether by using it themselves, or encouraging others was not a critical factor in early stages of development. However School 2 indicated that senior management support could be helpful once the intranet had started, as they were responsible for the extra funding to provide the auxiliary for the librarian, allowing her more time to work on the intranet. Funding was also essential in School 5 to allow for "populating" the intranet. This time it was provided by the authority. Since these were the two most developed

intranets there would appear to be some evidence that some management support may be helpful to progress the content of the intranet at a further stage of development.

8.1.9 Technicians

Lack of technician support was one of the main complaints from all schools in this research. The type of technician support varied a great deal across authorities and schools. However in no school was the presence of a technician found to be significant to the development of the intranet. This can be clearly seen by looking at the leading schools. Although School 2 would like more technician support to lessen the pressure on their computing staff it has not hindered their development. School 5 only received occasional support from technicians based at headquarters. In contrast it can be seen that School 8 with a permanent full-time technician, and Schools 7, 11 and 13 with two to three days of technician support, have yet to make real headway with content on their intranets.

8.1.10 Subject specialists

The authority interviews had suggested that Authority C's policy of an authority intranet would have subject specialists developing content. However there was no evidence provided by those interviewed in the secondary schools to suggest that the subject specialists were a useful source of curriculum support. It may be that this will change with time. With one exception there were no other authorities with subject specialists who had made an impact on content development for the intranet. The exception was Authority E and their school librarians. In comparing the two authorities the question must be asked why the work of the subject specialists in Authority E was known and valued by all interviewed but appeared to be unknown in Authority C? One explanation for their success is that the Authority E subject specialists, as practising schools librarians were already involved in mediating with teachers, in evaluating websites and had a knowledge of the current Scottish curriculum as practised in schools. What they provided was directly useful to school librarians who then became a source within the schools for encouraging further use of this curricular support. The content specialists in Authority C appeared to be more distant from what was happening in secondary schools with some suggestion that what they provided was more relevant to the needs of primaries. It may just be that those interviewed lacked knowledge of what the specialists were doing. Yet it appears that without direct involvement of key individuals who could encourage curricular relevance in schools, there is a distance between what the authority specialists do and the impact on schools. Authority E showed that relevant content can be of value from a central source.

The Managed Service Providers (MSPs) curriculum links (in Schools 5, 6, 9, 12) needed adapting to make them relevant to the Scottish curriculum. The MSPs did not play the part of subject specialist support. The curriculum support on the intranet was highly valued in School 5 only because the librarian had made a significant contribution to evaluating and adapting this support. This was emphasised when comparing the three schools within Authority B (6, 9 12) with the same URL support. Both librarians in Schools 9 and 12 made reference to personalizing the intranet. By "tailoring" URL support librarians 9 and 12 saw they could make their intranets of more value to teaching staff. As will be discussed this is a role that they both seized on. For them there was a gap in the content which the intranet provided. Curriculum support requires to be specific to the needs of the school and relevant to individual projects within each school. Once again the real intranet development comes from a bottom up approach, with user needs within the school a priority.

8.1.11 Groups as drivers

School 1 had indicated that a committee could be important. There was evidence in School 1 that this was a way of involving a range of staff. Their use of a questionnaire had allowed the ICT committee and specifically the Network Manager (PT Computing) to listen to staff and decide on a policy for future development. But it was clear that it was the Computing department who made the final decisions and used the ideas to move things forward themselves. When detailed study is given to what the committee in School 1 discussed, it can be seen to be relevant to whole school ICT development, not specifically the intranet. Only School 7 had made any significant use of an intranet group. The intranet group was the force behind the desire for the intranet but they had been unable to make it happen. They were at a standstill with the stand-off between ICT co-ordinator and intranet group. The group in this instance, were driving the intranet development within the school. But despite their training, despite having a member of senior management leading the group, they were still dependent on the ICT co-ordinator and his technical skills to instigate the work on the intranet. He, in this case was a key person in the school intranet development. What was at issue was the content of the intranet. The ICT co-ordinator implied that the intranet group did not understand the nature of the intranet, and the potential for interactive content. This adds to what was suggested in School 5 where the senior management were lacking knowledge of the intranet whilst the librarian was able to develop the intranet because he understood the potential of what it could do.

Most of the other ICT groups in schools met too infrequently to be effective. With teachers time at a premium this is not surprising. Despite the presence of an ICT group in School 3 they were not focusing on the intranet. Much of the work of ICT groups concentrated on access to hardware and on whole school ICT policies. It could be argued that these issues must be addressed before they can focus on the intranet and that therefore this research came too early for many schools. However in the contacts made to the librarians in the year following the interviews there was little evidence that these intranets with low content, had made much progress. It is perhaps easier for groups/committees to look at whole school issues such as policy, or curricular matters (eg School 9 whole school policy on ICT information skills). In School 5 the intranet group fell away after the initial decisions had been made on roles. Although librarian 5 and depute head 5 were both keen to move direction of their intranet to focus on administration, neither suggested the intranet group be resumed to discuss this.

Although in other schools there was non-supportive or an indifferent culture with a lack of a focus on the intranet (eg 3, 4, 10), the evidence suggests that groups, despite providing that focus in the early stages of implementation, will not be sufficient on their own.

8.1.12 Pilots

It had been considered that by the very nature of being pilots some schools would have benefited with their intranet development. What was surprising in looking at the pilot schools is that none of them were given extra guidance to develop their intranets. Being a pilot in itself was not significant (eg compare Schools 8 and 5). Why was there so little activity in School 8? One clear difference is that in the other pilot schools (5 and 12) there were individuals capable and willing to take the intranet on.

8.1.13 ICT co-ordinators

As stated in the findings the role of ICT co-ordinator was confusing. ICT co-ordinators whether senior managers, Computing or other teaching staff almost all complained of demands on time and considered that there should be a full-time post in relation to the network. There was a suggestion that the post should be in connection with teaching and learning rather than the technical side. Even with technical assistance (eg School 7 has two and a half days per week technical support), the ICT co-ordinators were stretched because of their teaching commitments. Only in Authority B did it appear that ICT co-ordinators took responsibility for managing and developing use of intranets (Schools 6, and 12) whilst in

Authority C there was an expectation that the ICT co-ordinators would “edit” the intranet with others helping provide content. In Authority B this was directly linked to the authority policy of a fully Managed Service which provided intranet structure with an appointed ICT co-ordinator in each school. The one exception was School 9 where the ICT co-ordinator did not have the necessary technical skills. This helps explain the lack of focus in the school and why the intranet had lain unused on the network for several years.

What became clear from assessing the role of the ICT co-ordinator was that where a senior manager was assigned ICT co-ordinator (and no other member of staff given specific ICT responsibility) the school was less likely to have any content on the intranet (eg Schools 3, 4, 10, 14). All senior managers who were also ICT co-ordinators in this research lacked both the skills and the time to create content for the intranet. This appears important if there are no other creators in the school.

What the last few sections have shown is that groups such as working parties or senior management, pilot schools and a range of individuals such as head teachers and technicians, are not significant to development of the intranet in the early stages. Although drive from senior management may be helpful in getting the intranet started (as in School 1), the more important need is for individuals to take up the cause of content. Both individuals and content appear significant. Individuals who have been identified as important are some school librarians and some ICT co-ordinators.

8.1.14 Activators, gatherers and mediators

In a number of individual schools specific people have been identified, such as head teacher 1 who had insisted on the intranet and the intranet group in School 7. They could be described as “drivers” as they were instigators behind the intranet. The ICT co-ordinators (eg 1, 6, 7, 12) and school librarians (eg librarians 2, 5, 9, 12, 15) have also been identified as key. Neither the terms “driver” nor “promoter” fully explains what these individuals did. The conceptual term which developed through assessing the actions which these people undertook was that of activator. These individuals were not simply promoters but were leaders who were doing something about creating content and using the intranet, both for themselves and others. The key point is that these individuals have the necessary technical skills to be able to work on content for the intranet.

A number of schools talked of using pupil developers to develop content for the intranet (6, 7, 12, 13). School 2 is an example of a school that made use of pupils (eg pupils doing PowerPoint presentation on school show, pupils taking photographs of local churches for RE mini-web, a pupil on work experience) and it did appear to be helpful. This was at the instigation of the school librarian. Some of the pupils may have been involved in web creation. But they were not the main content developers and their role is quite different to the activators. Two schools with a great deal of intranet content abandoned pupil involvement altogether (5, see also School 15 in role of school librarian section). This research suggests that pupils sent to departments looking for content cannot make the same contribution as librarians nor ICT co-ordinators. Activators need to be in charge, making decisions of what should be collected and where it should be placed on the intranet. Pupils cannot suggest ideas and links for project support in the same way that librarians are able to do. The content which pupils are likely to return with, is the type of flat, non-interactive content available in school handbooks (evidence in School 12). The pupils' role can be conceptualised as gatherers. It is suggested that schools who depend too much on the work of gatherers will not have interactive content relevant to the curriculum.

The activators are key people. As the intranet had developed differently in the schools with ICT co-ordinators leading the intranet, to schools where librarians were leaders, it became clear that there were also differences between activator roles. If Schools 6 and 12 are compared (ICT co-ordinators who had the skills and were expected to develop content) with Schools 2 and 5 (where the librarians were developing the content) what can be seen is that Schools 2 and 5 have developed curriculum content at a much quicker rate. School 6 has just started to focus on the intranet but School 12 have had several years of intranet structure in place. It was clear from librarian 12's interview and the demonstration that much of content was flat (information type content) and that departments were not using it to provide curricular support. Why was this? The ICT co-ordinator talked of problems in getting information from departments. The ICT co-ordinator in School 12 was in contact with all departments in the school. But he was not involved on a regular basis with resourcing matters or project work across departments in the same way that the librarians are. The content he discussed was very relevant to his specific role as ICT co-ordinator eg training materials, technical support notices. But there was a lack of curricular content. One of the key roles which librarians undertake in relation to the intranet is evaluating websites suitable to support the curriculum. In this research no ICT co-ordinators took on this role for teachers. They themselves expected departments to take responsibility for their own subject

areas. Librarians are not only operating as activators here but as mediators. Mediation is part of offering subject support, making suggestions, providing resources. It is a role recognisable to any school librarian. The librarians' expertise is not subject expertise but information expertise. It is natural for any librarian, working with research projects, to offer advice on what resources are available and at what level. A teacher would not expect to offer advice on resources to another teacher in a different field of expertise. Therefore it is not surprising to find no evidence of ICT co-ordinators operating as mediators. This explains why the intranet content has developed differently in Schools 5 and 12. In School 12 the ICT co-ordinator as activator is a non-mediator and does not work on the URL support given by Research Machines. The pupil gatherers are non-activators and non-mediators. The result of this is slower content development of the intranet. As in School 9 the curricular support on the intranet supplied by RM has not been tailored to the individual departmental needs. No-one is adding to it, checking it, deleting it. This leaves potential for the new librarian in School 12 to take on both an activator and mediator role.

Librarian 5 was able to provide curricular support for teachers through the interactive URL support. In School 7 the ICT co-ordinator had been given materials from departments. He was very disappointed in what he had received, complaining that it was more like a website ie "non-interactive." This relates to teachers not understanding the potential value of the intranet. The content which the intranet group had provided indicated that they were viewing it more as a website. This in reality was a display cabinet to promote and sell the key features of the school to the outside world. They had not provided useful content which could be utilised by pupils and staff to support their learning. Rather than a display cabinet the intranet has the potential to be an interactive filing cabinet of a more practical nature. The URL support provided by librarian 5 could be utilised independently by subject teachers and meant that the intranet there became a virtual library. In Schools 7 and 13 there were clearly individuals willing to work on the intranet. However without developing content of immediate classroom relevance for all staff the intranet was not fulfilling its full potential. What was missing in School 7 was a key individual who had the vision, skills and importantly time to develop that interactive content.

A key question addressed in School 14 was why were they removing their intranet? The immediate answer as given in the findings was the superior technology offered by the authority solution. It appeared that the school had not made much use of the intranet grid whilst they had it. There was no evidence of loss from the school (exceptions the school

librarians). The ICT co-ordinator was capable of being an activator (skills, contacts with range of departments). The website was to be their display cabinet to the wider community. The ICT co-ordinator considered that they could use the website to offer the same services as the intranet. The network would operate as a reliable filing cabinet with its different secure areas. As the intranet is not related to the needs of the school there is no value in it, no need for it. Without an activator who can see that value, working to promote content for the intranet there was nothing to show and encourage teaching staff. Without content on their intranet, the loss was not great to the school. Meeting internal needs appears to be relevant to the continuance and development of intranets.

In School 14 a technician was appointed and it appeared was expected to act as an activator in content creation. The appointment of the technician was part of their strategy for developing their website. In the year and a half since the interview the school website was viewed in order to assess the changes. In that time little changed. As with the ICT co-ordinators, technicians may not be in a position where they can supply resources or make suggestions to teachers on content. Although technicians may be important for reducing technical problems, time and stress on others in the school, they themselves are unlikely to be a key strategy for developing content and use of an intranet or website within a school.

The key to developing a school intranet is to have staff who have the technical skills to work as activators. These activators must be able to create content for the intranet. In schools where librarians have the skills to operate as activators and mediators, they are likely to develop curriculum support content more quickly.

8.1.15 No formal development

The authority interviews had suggested that there was a lack of policies and strategies for intranet development coming from authorities. It seemed plausible that schools themselves would require to have policies in place and use development plans as a way of moving their intranets forward. The findings of the interviews in schools clearly indicate a lack of detail in policies and development plans with regard to the intranet. If authorities are not specific this could explain why schools themselves are vague about how to use the intranet and how to develop it. It was only in School 2 that there was evidence of the librarian specifying details of her planned involvement in the intranet. This was not repeated in any other school. This again indicated the low priority given to the intranet with schools being more explicit on network technology and questions of access.

8.1.16 The need for immediate content

There was a clear divide in the schools concerning content of intranets. If we look at Schools 3 and 4 they have a basic intranet structure but no real content. The reasons they provide relate to lack of time, not a priority, no formal structure. Examples of these reasons can be found in all the schools which have yet to make any progress with content of the intranet. As stated there was no impetus from within the school to develop the intranet and an expectation of content to come from external sources. In contrast the schools with more content have not waited for outside resources but have developed their intranets from internal needs and used in-school materials. The suggestion as given in School 1 to “let’s go with it” and see where this leads partly explains these schools. There has to be a willingness to try. This can be seen in School 5 where the intranet was partially populated by the library assistant who lacked confidence in going “live” with it. Only once it had gone live could all staff in the school see the potential of the intranet. It could be surmised that if the prototype demonstrated in School 7 went live before further discussions on content this would have an immediate effect on the teaching staff in that school.

8.1.17 External pressure

The findings section clearly indicated that schools in general did not feel that there was any pressure to develop the intranet from local authorities, or government despite a large amount of the funding for ICT coming from there. This explains why we find schools with potential intranets sitting unused (School 5 delayed going live, School 8 pilot, not seen as a priority, School 9 RM grid, no-one doing anything with it for two years). The one external influence which was found to have had some impetus in three of the schools, was the HMIE. The HMIE encourages schools to use ICT in their learning and teaching. This has given impetus to individuals in schools to look at how they could make practical use of the technology. It appears that some schools will fail to make the most of their intranets until there is external pressure unless authorities become more involved.

8.1.18 Organic development

The theory development through the grounding process clarified that what was happening in the more successful schools was organic in nature rather than planned or directed. Schools had not started with a clear idea of what they wanted to do and where they wanted to go (eg lack of purpose, lack of groups leading development, lack of plans). The evidence for this also comes from the descriptions the leading schools applied to their development. School 1

talked of “ad hoc” meetings to start with, whilst both Schools 1 and 2 mention taking ideas which they then “run with.” Librarian 2, clearly indicated the lack of planning by providing the description “complete hotchpotch” to their intranet development whilst the ICT co-ordinator talked of the development in terms of himself and the librarian “thrashing out” ideas. School 5 used the intranet group to “kickstart” developments but similarly appeared to have allowed things to take their own course following this.

Although it can be argued that this is reasonable in schools leading change or innovation it may not seem helpful to the mass of schools when looking at strategies for moving forward change. But it could also be argued that this is a necessary part of the organic growth of the intranet if it is to be understood as “emergent” in nature and that acceptance of this nature is part of being able to develop an intranet.

8.1.19 Relevant content leads to critical mass

What was evident from the schools who had curriculum related materials on the intranet, was that they saw a clear link between both the content on the intranet and the Scottish curriculum. What they talked of was ensuring that the intranet was relevant to the curriculum as taught in their schools eg School 2 made use of pictures of local churches for RE, and of information on burghs in History. Librarian 5 talked of attempting to get project sheets from pupils to put on the intranet. The evaluated links (tailoring) provided by librarians 5, 9 and 12 meet an internal need and ensures that content on the intranet is appropriate for the topics studied and age groups in their schools.

Schools 2 and 5 developed content very quickly. The skills of the librarians and the URL support are the two key features. But what is also clear is that this area of content can be developed quickly for a large range of departments who can use these links away from the library, in the classroom or laboratory with pupils. It appears possible that it is the quantity of materials on the intranet relevant to so many departments across the school which helps in the whole school positive attitude to the intranet. It is the absence of any mass of relevant URL support in other schools which has meant that take-up and use of the intranet by staff has been very slow. And since we have suggested that ICT co-ordinators are unlikely to provide such mediated support for teachers, take up will continue to be slow in schools where librarians have no part in intranet development unless other forms of relevant content is available to encourage use.

The homework section along with all the "Issues" research topics and instructional websites developed by staff in School 15 indicated that they had a vibrant intranet which had a mass of content, relevant to their school needs. Time did not allow for further investigation in this school (added late to contribute to the role of school librarian section). In retrospect this could have been a useful school to look at for intranet development comparison. What can be seen from the librarians interview is that staff in the school were using the intranet to support their teaching. The curricular content was developed in-house. There was no suggestion of waiting for quality content to come from external sources. The mass of content was clearly relevant to the needs of their particular pupils and to the specific teaching in that school.

In School 2 staff were not creating the content themselves, but they were being encouraged to provide the materials to the librarian who did the creating for them. This is similar to School 5. Departments using the intranet do so because the content on the intranet was useful to them. It did not take great levels of skills for teachers to use the material on the intranet as it was prepared for them by the librarian. If they wished to put material up the librarian put it into a suitable format. Hence the skills teachers required could be described as low level skills. This could partially explain why staff in School 5 use the intranet despite little training. Because the librarian focused on the Internet links as a way of developing content for the intranet, he has done much of the searching of the Internet and evaluating of websites himself. Because the intranet went live with substantial Internet content there has been less emphasis on the need for teachers to develop their own skills. There are obvious dangers to this policy, not least the question of what would happen if the librarian were to leave. Because all the content creation is in the hands of the librarian (and his assistant) there is also a danger that other potential areas for intranet development may not be looked at. It works in this school because there is a capable person at the helm.

8.1.20 Snowball effect

The findings on integration into teaching and learning showed that teachers were often unclear on how to integrate the intranet. The need for examples, sparking off ideas was frequently mentioned. School 12 talked of pinching ideas from another school in the example of their network notices to help with ICT support. The term "organic" was used to describe the "hotchpotch" development ie without formal policies /guidance/structures in place. This can be taken further with the idea of a "snowball" effect where content on the intranet encourages more content and further use by giving examples and feeding ideas. This

idea was first raised by an intranet officer in the authority visits but was also mentioned by ICT co-ordinator 7 as to how they expected the development to happen. What is the evidence for this? It is clear that content in School 2 was developing rapidly. The email sent by the librarian 6 months after the interviews was full of new examples of her involvement. In School 5 although URL support developed rapidly there was limited examples of content ideas coming from teaching staff and no examples of the kind of teacher involved instructional websites mentioned in Schools 2 and 15. Librarian 5 talked of the difficulty in getting materials from departments to put on the intranet, hence he had tried to ask pupils for examples of worksheets. The reason he gave was that he considered teachers were not used to "sharing" their work and had a fear of scrutiny. At the time there were few examples for teachers to look at. And in the schools where ICT co-ordinators have put work on the intranet, it is mainly examples of their own work that are available. The exception was School 14 and the example of the Physics instructional website. This was intended to encourage other teachers but there was no evidence that that had happened. Examples on their own are not sufficient to get the snowball effect. So what was happening in School 2 that was not happening in other schools? It can be seen that librarian 2 was going out and speaking to departments and "making suggestions" about the potential of the intranet. The librarian was getting worksheets as part of resource based projects. The worksheets (or mini-webs) on the intranet were clearly linking instructional and resourcing needs. There was a reason therefore for teachers to share their materials on the intranet. In providing a "resourcing" element to their work, through utilising information on the Internet, and information sources in the SLRC, librarians are providing such a reason. The importance here is that the librarian was working that "snowball." The snowball effect does not happen on its own. School 15 and their librarian further indicated the importance of informal meetings, suggestions to teaching staff on how to use resource elements in their work on the intranet. This also was evidence of ideas feeding further suggestions and of the librarian acting as activator. What other schools in this research indicated was that teachers were not keen to promote their work on the intranet. But worksheets will be placed on the intranet if there is a reason for doing so. The librarians' input of adding the resourcing element (URL support, other information resources in the library, information skills support) provides a reason for why the material should be on the intranet and should be available to those using it in the library or in the classroom.

Schools in general have not started out with a clear purpose for their intranets. It is through use, through individuals giving direction, through examples and suggestions that a purpose has been developed. And there is potential for this purpose to change.

8.1.21 Information skills

The schools that were actively developing their intranets appeared to have different approaches to information skills, whether whole school policies or involving the librarians. It did appear that information skills was a concern for these schools and an issue which was looked at and in some cases reassessed (eg School 2 new programme of information skills, eg School 5, librarian had wanted senior management to tackle information skills. By the time of the senior management interview this was being addressed). Although School 9 has a whole school approach to information skills, it is clearly not related to use of the intranet with little drive from teaching staff for the intranet. School 8 has a librarian with a strong interest in information skills, who has done much to promote ICT skills to both staff and pupils across the school. Yet their intranet was not making progress. There is insufficient evidence to suggest that information skills is a key part of any schools strategy to develop their intranet.

8.1.22 Future developments

It had been expected that there would be have been more use made of administration on school intranets. School 13 talked in terms of administration data being a priority but the evidence of what has happened in other schools suggests that this may not happen for quite some time. Even School 10 who had purchased an intranet specifically for administration were using only basic features. School 1 indicated how email is preferred for sending out data (such as minutes) rather than placing these on the intranet. One explanation is the time factor, mentioned in so many schools. It is easy to send minutes out by email and ensures that everyone has a copy. If they are placed on the intranet, someone has to firstly check that they are in a suitable format and mount them. Staff still require to have their attention brought to the materials. Administration staff have not been involved in developing content for the intranet. Since the administration staff are the people who deal with minutes and daily bulletins then it is not surprising that this has not been an area which schools have developed. There may be a need for administrators to become activators. Schools 2, 3 and 4 who had the longest access to networks appeared to be more aware of the potential benefits of having some of the administrative data on the intranet. But clearly it is not a benefit which schools themselves see as a first priority. The reasons for this may be that in some

schools senior managers had responsibility for administrative areas such as timetabling. To get these onto the intranet quickly it is argued that these senior managers would need to be activators themselves or at least have a closer relationship with activators. And as pointed out in the findings, access to the secure areas on the network means that departments may not see it as a priority for material to go on the intranet. There is no perceived benefit to the intranet.

It became clear that administrative features had a very piecemeal development as many schools were tackling the same problems individually. School 10 was interesting in that they had specifically gone for an administrative intranet. Although using a few key features of this intranet they were quite open about not utilising and experimenting with further potential features. It is suggested here that to do so these features will have to have a key practical relevance and that an activator will have to emerge to use and promote them. There was certainly no obvious activator coming from within those interviewed to go beyond administration to develop the curricular side of the intranet. In School 5 the librarian had not tackled administration as it was not an immediate priority. He could see a use but it was going to entail increased work without being of immediate relevance to him. Without that immediate relevance no activator will look at the administration as a first priority.

Another suggestion is that the type of databases required for administration data may require more technical input, therefore it will be slower to get that snowball effect. It is relatively easy to get the snowball effect with the curricular input of URLs on the intranet. This piecemeal approach to the development of administrative features for school intranets is surprising. Mention was made of authorities working on pupil tracking and reporting but schools felt that it was not happening fast enough and that they needed to pay attention to it now. The authority interviews had indicated expected savings in relation to administration when discussing the intranet. This could not be seen in schools.

It is clear that no schools are yet using the intranet for management purposes. There was no evidence that senior management in schools were using discussion facilities for decision making within the schools. This research suggests that these potential uses are not of significant interest to schools themselves at this moment in time.

The leading schools recognise that there are continuing uses to be made of the intranet (eg School 5). But what these leading schools did not suggest was use of the intranet for online

collaboration, shareware tools and bulletin boards. Even schools networked for a substantial amount of years (eg Schools 1 and 2) were not looking to expand in this area. At the time of the interviews there was no clear curricular need for these, therefore they are likely to be of a low priority.

8.1.23 Summary of progress with intranet development

Schools were clearly at different stages in their intranet development. The previous “uses of a school intranet” have been reassessed to provide a clearer structure of stages of intranet development. This has required reconsideration of these “uses” and whether they relate directly to one specific stage. The following four stages have now been identified. Each stage is defined by general characteristics.

Stage 1: The communicating intranet

Definition: This is the introduction of the intranet into the school. This stage is generally characterised by low profile of the intranet and an emphasis on developing staff confidence in ICT with the general aim of supporting teaching and learning.

Functionality: Communicating. Focus of the school is on hardware and access. The intranet is not a priority.

Content: Schools at this early stage are likely to be making use of pupil areas and staff areas on their networks as repositories for maintaining staff data and pupil folders. They will be utilising Internet access and email without developing any specific content for the intranet. Schools provided with an intranet package from their Managed Service Provider may be using the curriculum links supplied, but will not yet be adapting these to suit the needs of the school.

Implementation process: At this stage there is likely to be general management support with an interest in increasing computer access and ICT training in general but no planning or specific strategies in place for developing the intranet. Schools generally did not set out at this stage with a clear idea of how they wanted to develop their intranets. This is partially explained by the variety of reasons found for the introduction of intranets: from the authority decision as part of their networking plans, to schools wanting a solution to a specific problem (eg administration) to schools where individuals saw the potential for the technology and build on previous network systems.

School culture: Uncertainty, lack of interest or possibly negativity.

Actors: In most schools a member of the senior management team has ICT in their remit including the intranet. In general senior management lack time and the hands-on technical

skills necessary to take the intranet forward. However it is important that the senior management develop staff confidence and skills in ICT. As such ICT groups may be implemented to focus on general technology related issues with ICT co-ordinators given responsibility to manage access to computers and ICT training. School librarians are interested in increasing their own skills and have concerns over ICT information skills of pupils in particular with regards to Internet searching.

Skills: Concentration on developing staff confidence in ICT, in particular in the skills of email and Internet use.

User awareness: Minimal as intranet profile is low.

Stage 2: Information gathering

Definition: This stage of intranet development is characterised by small pockets of activity in a limited number of areas such as gathering information from departments and purchasing external instructional packages. At this stage much of the content lacks interactivity. The intranets are still of a general nature with much similarity between content of each school.

Functionality: Publishing. Internal focus on flat content but external focus on instructional materials.

Content: School handbooks, and departmental information on courses are collected. Content of the intranet is influenced by the interests and contacts of the individuals who take responsibility for the intranet. For example ICT co-ordinators may focus on training materials or ICT support information, a librarian may develop school archive content. The ICT co-ordinator is likely to put information related to his own computing classes on the intranet whilst the librarian will place library related materials on the intranet. The provision of basic curriculum support (as supplied by Managed Service Providers) is still not being changed whilst schools may investigate the purchase of instructional packages. These are externally created.

Implementation process: There are still no specific strategies for intranet development. Where senior managers are active it is in supporting the externally purchased instructional packages, which one department may request and which may go on the network or the intranet. Although the individual responsible for the intranet may request content from departments, from senior management or from school clubs for the intranet, this is an informal request and the response at this stage is likely to be slow. Much of the development therefore is ad hoc and dependent on time and interests of activators.

School culture: Receptiveness to ICT uses, openness to ICT.

Actors: An individual is now responsible for managing the content (activator). ICT co-ordinators if given time are likely to take on the activator role. If the librarian has the right skills and interests they may become activators. Activators collect content from departments or clubs. Intranet/ICT groups or pupils (gatherers) may also collect some of the information and may be involved in some of the skilled work of putting the content into format for the intranet, but this will be under the supervision of the activator.

Senior management are supportive of ICT and provide finance for the purchase of externally created packages. Although interested in ICT, they are not yet active with regards the intranet and the collection of content from within the school.

Skills: The activator (likely to be ICT co-ordinator or school librarian) requires the technical skills to transfer materials into a suitable format for the intranet. Knowledge of HTML or use of an editor package such as FrontPage is necessary. The activators will also require some knowledge of servers and file structures. They must be able to request data from others in the school. Higher Computing classes may be used where pupils gatherers have some skills in adapting data into a suitable format for the intranet.

User awareness: This stage is characterised by limited departmental use of the intranet. There are likely to be pockets of use where departments may have purchased external packages. Curricular content on the intranet is often limited to the computing department.

Stage 3: The individual intranet

Definition: Stage three is characterised by interactivity. Intranets now have a clear individual identity closely associated with the needs and characteristics of each school. The key change is that curriculum support on the intranet is now tailored to each school.

Functionality: Publishing and interacting. An internal focus.

Content: Internet links are evaluated and structured towards the teaching and learning in each particular school. There is evidence of focusing links not just to particular subject areas but to pupil ability groups. There is evidence of teachers developing pages to support their lessons. The “flat content” school handbooks and departmental information of the previous stage are overtaken by interactive material pertaining to the general school “community” such as school shows or club activities.

Implementation process: The few individual examples of curriculum content have a snowball effect and encourage rapid interest from across the school in developing intranet content. There is a culture of sharing and a willingness by teachers to put content on the intranet. Staff require regular access to computers due to the desire for the snowball effect (irrelevant whether access is in staff bases or classrooms). Pupils and staff now see the

potential for using the intranet for extra curricular materials. There is a demand from users for content made with presentation software. The implementation process is aided by the demand from pupils to see what is new.

School culture: Internal encouragement. There is a willingness to share ideas in relation to ICT use, to share project work on the intranet and to focus on internal training as required in the school.

Actors: The activator is now encouraging a range of departments to submit content. Individuals within departments may themselves take on content creation roles. Mediators will be involved in “tailoring” the curriculum content to meet the specific needs of the school. They will provide evaluated web links (URL support) related to school project work, they will make suggestions and encourage teachers to supply research related worksheets used by pupils in the school. This research has shown that the key individuals likely to take on this mediating role are school librarians. Senior management support is important at this stage in providing funding to enable the activators and mediators partial release or extra support with their normal duties in order to work on the intranet.

Skills: Activators must have the skills, the time and be in communication with a range of staff. Skills include scanning (photographs, pupils work) and the use of presentation software such as PowerPoint. Mediators require some technical skills (but not necessarily to the same extent as activators), contact with departments but more importantly mediators should be involved in discussions of learning activities with teaching staff.

User awareness: The speed of content development has increased rapidly. This has been accelerated by putting examples of lessons on for other teachers to view. There is evidence of a wide range of teaching departments across the school making use of the intranet.

At this stage schools with individualised intranets saw these as successful. Schools continued to consider further uses such as administration. Despite the interest in administration and desire for the intranet to be used for such and despite all the skills available within the school there was at the time of this research little activity in this area.

Stage 4: The diversified intranet. (Further studies would need to be undertaken to thoroughly examine further use)

Definition: This further stage may see the intranet used for more advanced applications within administration (eg pupil reporting, library issue systems) and curricular areas (eg multimedia instructional websites) which could be developed using mobile media technologies. Development of this type would require specialised training and resourcing.

Functionality: Transacting & interacting

Content: Suggestions given in this research were administrative tasks such as pupil reporting and the library issue system. Some of these applications may have previously been available on servers on the network. Adapting such applications for the intranet enables full use of the interactivity and brings them to users attention. The instructional lessons on the individualised intranet which were adapted to support teacher's lessons may progress to grow into full online learning courses. These may make use of a variety of multimedia applications.

Implementation process: These will require more directive support from senior management. Instead of content developing organically from the bottom up as individuals have seen the opportunity to use the intranet, decisions on administrative use will require agreement from senior management. They will require a clear idea of what they want the technology to achieve. Financial support, key appointments and security concerns will have to be dealt with.

School culture: Acceptance as the intranet becomes integrated into every aspect of school life.

Actors: It is suggested that to diversify, the school will need to appoint key activators who have more technical skills and a knowledge of the new area for development. In this instance technical support staff may be required to help develop the structure of the more complex systems for the intranet due to the need for secure systems. It is possible that the current mediators or activators do diversify but it is considered that they would require suspension from current duties (eg teaching or the library) and extensive external training to support this. Whichever option taken, senior management would need to take control of the project and provide funding. To make full use of the potential of multimedia resources it is likely that authority intervention will be necessary in order to overcome the problem of funding. Senior management commitment at authority level and activators at authority level and beyond should be considered in particular School Library Services and Learning and Teaching Scotland.

Skills: Senior management require project management skills. Activators require a high level of ICT skills with knowledge of databases.

Take up of the intranet: This could ensure integration of the intranet in making use of the administrative potential to support learning and teaching.

8.1.24 Conclusion

Development of intranets in schools has been organic in nature and has come from a bottom up approach with key people developing content as it is relevant to their use. This is why some schools may progress their intranets differently depending on who the activators are, their time and interests. The culture of the school appears significant only in so far as these individuals have to be allowed to flourish. However there must be a receptiveness from staff to technology, in order that they use the data created. Support from senior management, on-going training, an internal culture of encouragement are all seen as positive factors but they will not in themselves provide the key individuals willing to act as activators. These individuals must have ICT skills and be motivated to create content. As the benefits and value of the intranet are seen and understood, support from senior management becomes more relevant for further expansion. The features of the technology are not critical but the individual skills of the activators and social interactions of the mediators are.

In order to make progress to further stages of development in schools it is suggested that these criteria must be met. To progress from

Stage 1 : Intranet development will stall unless an individual with the necessary ICT skills to develop content takes on responsibility for the intranet.

Stage 2 : Intranet development will continue to be slow unless interactive learning content is shared on the intranet. For this content to be available, an individual is required to encourage use of the intranet for curricular means.

Stage 3 : Senior management will have to initiate development, and an activator with advanced ICT skills be appointed to work on areas for further development.

The first descriptive stage outlines a lack of focus on the intranet which was evidenced in the findings. However it is important that schools provide confidence in ICT as a bridge to developing the intranet. An ICT group or ICT co-ordinator with time can help in that provision. In the second stage individuals were clearly key to development. In some schools there were no obvious individuals. It is suggested that either an individual with appropriate ICT skills and time be given the role of intranet manager or consideration is given to an intranet group to provide a focus for potential individuals. The intranet group should consider activator roles and potential curricular content. Both are important for stage three of intranet development. It is suggested that school librarians should be co-opted onto both the ICT group at stage one and the intranet group at stage two. School librarians have a key role in curricular resourcing, are in contact with a range of departments, have an interest in

information skills, whilst the LRC is a focus for ICT. As the findings have shown they have potential to contribute to the development on an intranet.

The diversified intranet provides some insight into potential intranet development. The above criteria are now incorporated into a predictive model of intranet development in table 16.

Criteria / Stage	1. Communicating	2. Information gathering	3. Individualised	4. Diversified
Systems:Content	Network areas, email, Internet use, URL support if provided by Managed Service Provider	School handbooks, information on departments. Some content dependent on interests of activators, bought-in instructional packages	Curricular links /instructional websites adapted to needs of schools. Presentation software used to promote extra curricular content	Eg Administrative areas, online learning courses, multimedia resources
Systems: Functionality	Communicating: Hardware issues, access and training	Publishing: Focus on internal flat content and externally produced curriculum resources	Publishing & interacting : Internal focus on curricular needs and school community/ethos	Transacting & interacting: eg pupil reports, library systems. Integrate curricular & admin.
Implementation process	ICT focus Lack of focus on intranet	No specific strategies but informal, ad hoc intranet development	Directive from senior management as activators given time and support to develop content.	Strategic support within school & authority for funding and appointment of key actors
School culture	Uncertainty, may include negativity	Openness/receptiveness to ICT uses	Encouragement:to share ICT related teaching practices & training	Acceptance
Actors	Senior management appoint: ICT groups – to focus on access & training. School librarians as co-opted members, promote LRC in providing access & ICT skills to pupils ICT coordinators – to develop staff ICT skills	Senior management- encourage individuals, consider an intranet group to look at roles & intranet content. From this activators (eg ICT coordinators or school librarians) take responsibility for managing intranet (informal) Intranet groups/ pupils operate as gatherers	Senior management directive support – appointment of roles, funding, provide opportunities for informal in-school ICT training, enabling sharing & cascading of knowledge. The activators (formalised) work with staff to cascade content creation skills. Provide early examples of intranet use. School librarians (mediators) work with departments to encourage use of intranet for research projects, provide URL.s.	Activators /ICT technicians within the school Activators outwith the school; enabling sharing of more complex, expensive multimedia resources between schools (eg Authority School Library Service, Learning and Teaching Scotland)
Skills	ICT management: In providing access & developing confidence in ICT	Technical skills: Activators require ICT skills for developing content (HTML or use of editor package such as FrontPage). Knowledge of servers, file structures	Communicating, instructional & technical: Activators- ability to scan, use presentation software & instruct teachers on creating own content Mediators – initiate ideas, suggestions to teachers on instructional projects	Project management Advanced ICT skills required for activators Database interrogation software
User awareness of intranet	Slow, low profile, lack of interest	Limited departmental use. Pockets of use	Enthusiasm as accelerated use across all departments. Push from pupils & teachers	Full integration to support every aspect of school life
Criteria to be met	Find individual with ICT skills to take responsibility for intranet (activator)	Content which will be of regular use to teachers and pupils if intranet is to reach its critical mass (eg URL support and in-school project materials). Individual required to provide such content (mediator)	Appointment of activator with highly developed ICT skills to work on more complex applications	

8.2 Development of theory in relation to the role of the school librarian

What is clear from these findings is that the role of the librarian within Scottish Secondary schools can vary substantially. This is not a surprising finding in that the methodology of grounded research requires that variation and negative instances be sought. This discussion will now try to uncover the explanation of why the variation has occurred and what are the reasons for some librarians taking on a more central role in intranet development in schools. As before, the ongoing analysis sheets were used to make causal statements in relation to each individual case. These were then compared with previous schools, looking for patterns. As developing theory demanded, certain schools with particular dimensions were then sought (see Table 6). By constantly comparing the causal statements the main themes have been identified. These will now be presented as a "story" (Strauss & Corbin 1990).

The roles will be discussed within the three broad groupings used in the literature review and findings section. However this time the discussion will focus firstly on the technology roles as the "causal" factors relating to these were the first "story" to emerge. School 15 is discussed separately at the end of each section.

8.2.1 Technology roles

As the findings indicated there were a range of technology roles identified for the school librarian.

8.2.1.1 Recent graduates

It is clear from the findings that four librarians took on more technological roles than the other school librarians (2, 5, 9 and 12). These were the younger school librarians. As the age of the librarian became a potential factor in the librarian's involvement in the different technology roles there was some concern as this had not been asked within the research questions. What was asked was their experience in schools. At School 5 this was refined through the questions to "date since graduation" (Appendix 19). The evidence from Schools 1-14 shows that the four librarians who undertook the more "technical" roles in relation to the intranet, all graduated within the last five years. However this was not the whole story. There was still variation within these technical roles and other factors had to be considered. This variation showed librarians 2 and 5 taking on almost all the technical roles identified, with librarians 9 and 12 not being involved in network administration and with a more limited role in technical support. Librarian 12 had only provided content but will soon be

involved in management of the intranet. Of the longer serving graduates only librarian 4 had any substantial technical role, in network administration and to a very limited extent in content creation.

8.2.1.2 Self-training

The first question that has to be tackled is what is it about a recent graduate which makes them more likely to take on the technical roles? The obvious answer would appear to be technical skills. However when the data was scrutinised it was clear that technical skills learnt through their training for librarianship was not the answer. Librarian 2 had no web authoring or network administration qualifications. She had gone on courses provided by the education authority to acquire these. During the interview she gave an example of her inability to succeed with the technology at university. She had the same web design training as librarians 3 and 4, yet they do not carry their training through into practice in a similar way. Two of the other three recent graduates who were building the intranet front-end or developing web content also required knowledge of specific skills to do this. To become "intranet editor" librarian 5 and his assistant were given FrontPage training, although as stated in the findings they had already surpassed that level. Librarian 9 was working from a "book," learning the necessary skills as he was putting the intranet front-end together. In these schools the librarians displayed a level of competence with ICT and the ability to "self-train" or carry-on training. ICT co-ordinator 9 considered that the librarian already had the necessary skills for building the intranet and appeared unaware of the librarian working from his book. The ICT co-ordinator herself, felt that she would need training to take over that role once the librarian had gone. It is only librarian 12, admittedly the most recent graduate, who had any experience of web-authoring. Yet at the time of the interviews it could be argued that librarian 12 had the least technical role of these four librarians (i.e. not working on the front-end). It was clearly not the specific skills used in either putting the intranet together or creating the content that was essential. The librarians provided evidence that it could be done with self-training. This self-training was also related to interest and confidence in ICT. This needs to be considered further.

8.2.1.3 Interest and confidence in ICT

Interest in ICT was demonstrated by librarians 5 and 9, the only two librarians in the research project to undertake further study, both in ICT related areas (see Appendix 19). Librarian 12 talked of creating web pages as a hobby, mentioning in particular local history websites. Although there was no hard evidence of librarian 2's interest in ICT, she did talk

about working on computers at home. Of the longer-serving graduates only librarian 4 mentioned an “interest” in ICT but provided no further evidence of using this beyond normal work routines.

By comparing the three schools within Authority B (Schools 2, 3 and 4) this allowed the researcher to look for other evidence in relation to recent graduates. All three librarians in this authority had recently been trained, had similar school intranet structures and local authority support but only librarian 2 (the graduate with less than 5 years experience) had gone on to apply this to working on web pages and then taking over intranet building and management. Although librarians 3 and 4 both appeared to have good ICT skills they were far more reticent about moving ahead and “leading” intranet development, despite senior management in both schools who were keen that their librarians be more involved. There was clear evidence that the senior management in School 4 had encouraged the librarian to take on responsibility for the intranet. In both Schools 3 and 4 the intranet was not being seized upon by any other department in the school. This gap provided the opportunity for the librarians to play a central role.

In School 2 the librarian talked of looking at the intranet which she described as “rubbish” and taking it home to put together a more “slicker” (ICT co-ordinator 2’s comment) version. This says something about the attitude of the librarian and about her confidence. She made the statement “If you don’t try something you will never get anywhere.” It indicated how she viewed her work. Not everyone would be prepared to put the effort in “at home.” This could relate to the fact that being a recent graduate she was keen to make her contribution to the school without other commitments to stop her putting in extra hours.

In contrast librarian 4 after her NOF training, worked with a pupil to provide the homepage for the intranet but did not go beyond this. The reasons she gave were varied: the need for more training, lack of time and the fact that there was no focus for her to become involved with within the school. It is quite possible that there was a need for more training, but there does appear to be some evidence that training provides the basics and that if librarians are “interested” they must be able to build on that and “self-train” further. The lack of time is interesting. Out of the three librarians in this authority only librarian 2 at the time of the interviews had no auxiliary support (see Appendix 20). It is a slightly smaller school but in theory librarians 3 and 4 had more support and thus “time” to spend on other initiatives. Time does appear to be a constant issue for all librarians involved in this research. The third

reason given by librarian 4 is lack of focus, also mentioned by librarian 10. Both appeared to want a working party, or group to which they could attach themselves. However it is clear from the findings on development of intranets that there were few examples of groups leading intranet initiatives and that most development was led by one or two individuals in an "ad hoc" manner. Longer serving graduates appeared to prefer more structure in their involvement with intranets and as mentioned in the findings were content to leave early development to others in the school. In contrast librarian 2 could be described as an "initiative taker," more prepared to take risks, committing time and effort to a new venture.

8.2.1.4 Initiative takers

Can this label of "initiative taker" be applied to the other more recent graduates in this research? Librarian 5 stated that the librarian was the "obvious" choice for intranet editor. He was perhaps fortunate at being involved as a pilot school for the intranet where there was early meetings of an intranet group. This was perhaps what some of the longer serving graduates would have preferred. Despite this, librarian 5 commented on how he would have liked more guidance from the authority. But importantly the lack of guidance did not hold him back. Librarian 5 talked of a "power vacuum" in the school where no-one else was prepared to take on the role. The opportunity was there and he took it but he did not have to force himself into that central position. The early meetings of the intranet group fell away and it was the librarian and his assistant who push on with the intranet. The depute head considered that others in the school could have taken on the intranet role as other staff have the technical skills. But there was an admission that no-one could have done it in the way the librarian had. The reason given by the depute head is that no-one else has the time. Librarian 9 similarly acknowledged that he does not have the same time pressure as teachers. There does appear to be some "flexibility" with the role of the librarian which allows them to follow areas of interest.

In Schools 9 and 12 both librarians had to ask permission to get involved. No-one in either school considered it a "natural" role for the librarian. It has to be said that librarian 9 did not do this immediately (but after the intranet had been in school for two years). It can be seen that, as in School 5, there was a "power vacuum" with no-one else in the school willing to lead development of the intranet. Yet librarian 9 used the term "muscle in." From the fact that the intranet was going to be "left" when he left, it hardly appeared that others were unwilling to give the librarian that role. But it does suggest that the librarian himself felt that it was not part of his role. Librarians 2 and 5 by separating the role of librarian from all the

technical tasks they undertook also suggest that they consider it to be different. It is not what is normally expected of school librarians. The researcher has to question how much effect she had on librarian 9 "muscling in." He had been contacted with regard to participating five months prior to the interview and it is during those 5 months that the bulk of the work on the front-end was done. But it cannot be denied that librarian 9 took the initiative to do something with the intranet where others in the school had not.

Alongside the idea of librarians as initiative takers, interested and competent in ICT there is now a picture of schools where there are power vacuums and teachers unwilling or unable to commit time to the intranet. However this power vacuum does not exist in every school.

Librarian 12 also has to seek permission from the ICT co-ordinator for web-authoring rights (so also an initiative taker). As the intranet was already developed and structured there was no need for him to be involved in that side. The intranet grid had come from RM and had been worked on by the Computing department, with pupils helping provide the content. As with School 1 the intranet was firmly in the hands of Computing. After the visit to School 1 the researcher had considered that it could be very difficult for a librarian without confident skills to break-in on the management side of working on the intranet. Librarian 12 appeared aware of this and started by concentrating on the library pages and talked of not wanting to step on other people's toes (eg re departments subject links). From the librarian's comments it was clear that the content of the intranet as a whole is what we would describe as "flat" content information. The librarian considered that he could supply a different type of content, in information on resources to support the curriculum. There was evidence of a "gap" and librarian 12 talked of "something that I think I can contribute to" and "an appropriate thing for me to extend my remit." As with librarian 2 it appeared that this recent graduate was looking for an area in which he could add something to the school. Therefore in School 12 there was not a "power vacuum" as such, as the Computing department had already set-up the intranet, but there was a "gap" in what the intranet provided, which allowed the librarian to show an interest. It could be argued that the same gap existed in School 1. At the time librarian 1 lacked the skills and knowledge to become involved. Contact with the librarian one year after the interview confirmed that despite NOF training she was not yet working on developing library content for the intranet. This strengthens the argument that there was a difference in attitude, interest and confidence towards intranets between recent graduates and longer serving graduates.

It is ICT co-ordinator 12 who in the interview with the researcher made the statement that he planned to involve librarian 12 in the intranet management now that he knew what he could do. This indicates perceptions of what teachers may consider librarians capable of. ICT co-ordinator 12 referred to the previous librarian's lack of ICT skills in answering the question on why the librarian had not been involved initially. What we cannot say for certain is if the Computing department had not set the intranet up, whether the librarian would have taken on responsibility for building and structuring the intranet. The implication from his interest, obvious enthusiasm for the intranet and the fact that he had more web experience than either librarians 2, 5 or 9, is that given time he would have been likely to do so.

Librarian 12 was described as "quiet." Librarians 2 and 5 from their interviews and from the descriptions applied to them can be seen to be strong characters (5- "evangelist" ; 2 - "dynamic"). There was no such strong descriptions of librarians 9 and 12 and this would therefore suggest that the initiative was not necessarily about being forceful, or about being a "character" in the way they led development. But it does appear to be about seeing a need for something and being willing and capable of taking that opportunity to be involved.

8.2.1.5 Explanation of intranet building and managing role

The evidence suggests that there are opportunities for librarians to be involved in the building and management of intranets. These opportunities arise where recent graduate librarians

- i. have an interest in ICT
 - ii. can self train and
 - iii. show initiative
- and may iv through the flexibility of their role be looking for areas to make a "contribution" to the school
- and where schools
- v have a power vacuum in relation to the intranet
- OR
- vi have a gap in the type of content they provide.

8.2.1.6 The explanation for the network administration roles

This may explain the involvement of librarians in building and in managing the intranet but it does not explain the network administration role. In School 3 the ICT co-ordinator was keen for the librarian to have more network administration responsibility. Librarian 4 was

unusual, being the only longer serving graduate who had some network administration responsibility, albeit shared with others in the school. Like School 3 the senior management and ICT co-ordinator wanted the librarian to take on more responsibility for intranet management. Unlike Schools 2 and 5 this librarian was clearly not happy and was stressed by the demands being made on her. The senior management appeared aware of these stresses. So why then was the librarian being encouraged to take on these roles? Undoubtedly it has to do with School 2 and the role of that librarian as a "technology leader." School 2 was named in both the interview with ICT co-ordinator 4 and librarian 4. There was evidence that a number of librarians throughout this authority have taken on these network administration roles and that this fact is known by senior management across the authority. It is therefore visible. Only in one other authority (Authority F) was there another librarian involved in network administration (School 5).

What then is it about Authorities E (Schools 2, 3 and 4) and Authority F (School 5) which makes it more likely that the librarians be expected to take on these two technical roles of network administration and intranet management? One organisational factor is that none of the ICT co-ordinators in these four schools were Computing teachers. In most other authorities the ICT co-ordinator was a role given to a Computing teacher or Business Studies teacher. Where senior managers are ICT co-ordinators they may not be so willing or able to spend time themselves on network administration. When compared with Authority B (Schools 6, 9 and 12) there is another reason which emerged to explain why some librarians have these technical roles and others do not. ICT co-ordinator 12 talked of how he had to speak to the Managed Service Provider to get passwords changed. Librarian 9 mentioned the complicated method which required staff from the Managed Service Provider to put new CD ROMs onto the system. Their intranet was provided as part of a fully Managed Service with the technical support to go with it. Therefore less network administration and management of the system was done within the school by staff. In making the ICT co-ordinator the contact person for the Managed Service (the system adopted throughout Authority B) there was no need to have others within the school share the responsibility of network administration roles. This explains why librarians 6, 9 and 12 would never have similar tasks to perform as librarians 2 and 5. The authority decision on type of intranet (innovation) system provided and the related personnel roles affects the role of the school librarian. In Authority C (Schools 7, 11, 13) the person responsible for the network is not the ICT co-ordinator but the ICT Officer (ICTO). Again as with the Managed Service there is less need for network administration to be carried out by teaching staff in the school. This may explain the views

given by ICT co-ordinator 11 towards the question of network administration and the role of the school librarian.

The findings also suggest that those involved in network administration are also likely to be more involved in technical support (eg librarians 2 & 5). It may be related to the skills and willingness of the individual, as librarian 3 is less keen to offer support. Although librarian 12 clearly has the skills, he talks about "keeping quiet" which is easier to do if there is not so much need for the support within his school. The responses of librarians 2 and 5 suggest that they see technical support as an inevitable and necessary part of being a technology leader in the school. There was no questioning from them of this role.

The role of the school librarian in relation to the administration roles is dependent on whether

- i. the authority in which the school exists has no fully Managed Service or ICT officer
- and
- ii. has a policy of appointing senior managers within schools as ICT co-ordinators.

If these two circumstances exist then there is the possibility that librarians may be "encouraged" to take on network administration roles. The date since graduation and interest and confidence of the school librarians is irrelevant to whether the librarians are expected to take on the administration role but may go towards explaining those who do take it on and who also offer more technical support.

8.2.1.7 School 15. Further discussion of the technology roles

After analysing the data from schools 1- 14 it was considered that not sufficient longer serving graduates with excellent ICT skills (as opposed to good or confident) had been included in the research. Librarian 15 had been included in one of the informal visits during the grounded process (see Appendix 3.3, School 1). This librarian displayed high level of ICT skills and was very involved in developing instructional websites which he had hoped would become part of the intranet (but not at that point building the intranet, managing the intranet nor involved in network administration). In an attempt to "test" the above explanation a repeat visit was paid.

Importantly this longer serving librarian did not have to build the structure of the intranet (done by Computing), was not responsible for uploading information onto the intranet (only the technician and Computing department could do this) and did not have control of the content of the intranet. There was no power vacuum as Computing had control of the intranet. Librarian 15 did have the skills to manage the intranet (although self-taught, he was involved in ICT training within the authority) and displayed plenty evidence of interest, and confidence. He did not however take the initiative and take on the intranet when it was started within the school. As a longer serving librarian he was unlikely to have major involvement in these management roles despite quite clearly having skills to do so and therefore would appear to suggest that initiative and "power" structure within the school is more significant than skills and ICT interest of the school librarian. But School 15 shows that librarians can still have a significant input into intranet content even when not involved in the development and management side. This will be discussed later.

Librarian 15 had however taken on network administration roles. This was seen as an attempt to share responsibility between the Computing and Business Studies departments. This compared to School 5 where the librarian talked of the "more people who do it the easier." But another possible consideration identified in this interview is that the SLRC is an area of high pupil ICT use, where many of the problems occur. It makes sense for the librarian to be able to investigate the causes. The ICT co-ordinator was head of Computing but as this authority had no fully Managed Service again much of the network administration had to be done within the school. Therefore School 15 complies with the earlier explanation of the network administration role. Age and interest of school librarian is not significant but lack of a Managed Service and the need for network tasks to be shared within the school is significant.

Librarian 15 provided technical support beyond mundane matters. It could be argued that this was part of his immersion into the technology, in knowing how everything works, essential even when not building the intranet. For librarian 15 it was also part of being able to offer a service to teachers, which came with training teachers in ICT skills. If the technology is in the library this may be where many of the technical problems occur.

8.2.1.8 Conclusion on technology roles

Other longer serving librarians followed the pattern of librarian 4. Not everyone had completed their NOF training but no-one else was involved to any extent in the technical

roles. It is clear from some of the responses that other librarians were shocked at the suggestion that they be involved in technical roles (eg librarian 8). Nor could it be stated that there was any significant difference in attitude between those who graduated 5-10 years ago and those who graduated 10 plus years. Two of the longer serving graduates had been in their current posts for less than 5 years (librarians 11 and 13). They still had more in common with the other longer serving graduates than the more recent graduates. Two longer serving librarians were hoping for library assistants (librarians 7 and 11), whilst librarians 6, 8 and 10 were also awaiting training at the time of their interviews. The emails sent a year after the interviews to check whether any of these factors had made any change to their involvement in the technical roles indicated no change.

It is stated that the role of the school librarian in relation to the building of the intranet and management of the intranet is likely to be defined by whether there is a

- i power vacuum in the school in relation to the intranet.

Where this exists and the librarian has the characteristics of

- i an interest in ICT
- ii can self train and
- iii show initiative

and may iv be looking for areas to make a contribution to the school

then there is potential that they will be involved in the building and management of the intranet. It is likely from the evidence of this research that these may be characteristics of recent graduate librarians.

Any school librarian may have a role in network administration if the authority in which the school exists has no fully Managed Service, no ICT Officers responsible for the network OR if senior managers operate as ICT co-ordinators. As part of the immersion into ICT librarians may provide some technical support if they have the skills and time.

8.2.2 Resourcing Role

Almost all librarians were providing some curriculum web support through Internet searching. The findings show that four librarians (the more recent graduates) were providing or intending to provide this support through their intranet pages.

Why do the other librarians, such as 7 and 11, take a low key approach to URL support via information which is only available in the SLRC? Why do only the more recent graduates focus on information pages on the intranet?

8.2.2.1 Control

An obvious answer would be that because they were involved in building the intranet, librarians 2, 5 and 9 had an element of control in placing the information there. The rest of the librarians had to go to others in the school to load the pages. Therefore they may have felt inhibited by this difficulty. Because he was in control of structuring the intranet, librarian 5 made the library pages with his Internet links central. However none of these problems was mentioned by any of the librarians and it was clearly not an issue for recent graduate 12. He stated that it did not matter where the links were. As discussed in the development of intranet section despite departmental pages, teachers were not adding to these with subject related Internet links therefore leaving a content gap. The librarian was filling the gap by adding these within his own pages.

8.2.2.2 Lack of Confidence

Could lack of confidence explain why despite having skills to develop web pages containing resource information some librarians (eg 3, 4, 7, 11, 13 and 14) chose other methods of providing Internet curriculum support?

The librarians in School 14 put this down to a lack of software (although they could have used a basic free FrontPage system). The intranet was available for at least six months after their training before the decision for it to be removed. In that time librarians 14 did not make a start on developing web pages. The other librarians mentioned issues of time. As longer serving librarians they may have other role commitments within the school which take up time. The roles such as homework support and in relation to the careers library suggests that there is potential for school librarians to develop resourcing roles in different ways. But librarians 7, 11 and 14 have committed time already to providing URL support. They were unable to make the leap to have that support on the intranet where it would be of greater use.

Librarian 7 by providing this type of information in folders has spent time and is "interested" to a certain extent. There was no mention of putting the librarian's work onto the prototype of the intranet demonstrated. In fact there was no library section on the prototype. Librarians 14 with their project packs including URL information were also spending time working on URLs. Librarian 11 was creating pages in a format suitable to go on the intranet, but chose not to promote this outside the SLRC. The intranet in School 11 has not been put together and gone live. However the librarian seemed unaware of this and had not told the ICT co-ordinator of the work she had been doing in the SLRC. And the ICT co-ordinator appeared uninformed of the librarian spending time creating curriculum linked URLs to support subjects. Therefore the librarian's work on URL support remained invisible. This clearly was not only an issue of time but indicated a lack of "confidence." Confidence to make "public" the intranet was mentioned in School 5 where before the arrival of the current librarian, the assistant had been populating the intranet but had not gone "live" with it. It took the more recent graduate 5 to have the confidence to make the decision to go live, even though the intranet was incomplete.

8.2.2.3 Isolation versus visibility

It is important to look for possible reasons to support this notion of lack of confidence in the longer serving graduates. In proposing the causal relations for intranet development one of the early negative issues which appeared was librarians' sense of isolation. Librarians 3 and 4 felt that there was no point in working to provide material for the intranet as they would have to do it on their own. They felt there would be no guarantee that teaching staff would use the materials they provided. Librarian 3 talked of how it could be a "waste of time." This clearly indicates lack of confidence in the value of the intranet as a curricular tool. There may also be an issue in that if the library pages do not have a central position on the intranet some librarians may feel that no-one will look at them, again indicating lack of confidence. None of those who have supplied URL support on the intranet felt that the information was not being used. Librarian 5 pointed out that much use is made of his links away from the library. Librarian 4 discussed the difficulty in getting staff to collaborate on research projects. Librarian 11 also talked of not being involved in providing resources for pupil research. Librarians 6 and 13 clearly have low involvement with teachers in research projects. However it cannot be the only cause as there was plenty evidence of collaboration in interviews 7, 8 and 14 all of whom also failed to make use of intranets for resourcing. These three librarians appeared to have good relationships with departments and a good knowledge of the curriculum.

It could be argued that the four recent graduate librarians, because they were newer had actually had less time to build relationships with staff. Yet it is evident that lack of collaboration, lack of involvement in resourcing and time to build a thorough knowledge of the Scottish curriculum was not an issue for these four librarians. There could be a number of reasons; they may not have been in schools long enough to suffer from some of the cynicism that is evident in the longer serving graduates interviews. Within interviews 4, 10 and 13 there was evidence of disillusion about the career of a librarian. Librarian 1 talked of feeling "overwhelmed" with all the changes which she had experienced as school librarian. The recent graduates have not had to face such changes. It could also be related to the fact that what the more recent graduates are supplying via the intranet was bringing them in closer contact with teachers.

When comparing the intranet roles in School 2 and School 5 it is clear that the librarians had a very different approach to the resourcing question. Librarian 2 was actively seeking out and involving more and more departments each year and taking a project approach. She started working with departments who use the SLRC and gradually increased the number of departments involved. Librarian 2 talked of "suggesting" a mini-web to the Modern Languages Department, something they "hadn't thought of." It is related to having ideas, being in a position to "see" and make these suggestions. This is the mediator role as discussed in the previous chapter. The librarian indicated confidence by making the suggestions to staff. The librarian was going out, suggesting, showing, creating. As stated in the development of intranets section this is an active role. A consequence of librarian 2's involvement in the intranet was that she was given an auxiliary. The depute head was quite specific that this was to allow her time to visit departments and to work more closely with teachers. She was only given an auxiliary after proving the need for more support.

Librarian 5 worked much more centrally on his curricular links, his library programme of information skills and appeared to be more based in the SLRC. There was no mention of going out visiting departments or attending departmental meetings. Does it matter that they had different starting points? Is there going to be a difference in the end result? Librarian 5 had reached an encouraging point, as it appeared that he had not had a history of "high" involvement in research projects. Teachers did not always come to him in advance in preparation for research. But what comes over in the interview is that his involvement in the intranet has made teachers and ultimately the senior management more aware of the

librarian's role, thus increasing visibility. As teachers realise the potential of the intranet and librarian involvement then this can only be helpful in encouraging further use.

An interesting point was made in School 8 where the librarian stated that the teachers reacted with surprise to the news that she would undertake Internet searches for them. This indicates again that teachers may not always be aware of what librarians can do for them, and may not be aware of what the librarian's role is. This highlights the need for librarians "to make visible" their role. This in itself can be related to the intranet, which is a mechanism for providing "visibility." The information on the intranet is "out there." This contrasts with the URL links in the library folders (School 7) or bookmarked on the library computers (Schools 10 and 11) which are much less visible. This explains why librarian 5 by "going live," by not waiting until he has the perfectly finished information pages, has in fact actively encouraged use by making "visible" the kind of information which pupils require for their projects. Although there may not be a history of collaboration between the teachers and the librarian in that school, by creating a focus for research, the SLRC has increased its presence and developed use. One outcome of librarian 2's involvement in the RE instructional website was a departmental meeting to improve it for next year. The website may not have been perfect, but as with all educational materials it can be evaluated and improved. In the meantime it visibly highlighted the potential to other teachers in the school. In the discussion on the development of intranets, the need for examples was discussed. These librarians by making visible their work are providing examples. Depute head 5 talks of the role of the librarian as being "a surprise element" but something that was welcomed. This again indicates that teachers may not be aware of the potential of the librarian's role. One of the correspondents from OZTL-Net made the comment that her role with the intranet made it very difficult for teachers to ignore her (Appendix 3.1). Previously pupils' research work could go on without that collaboration. There is an element of this in Schools 2 and 5. It is difficult to say whether librarians 9 and 12 would get to this central position as they both require more time to develop content. Librarian 12 talked of plans to work with departments as part of the NOF training to provide curriculum related research pages and would appear to want to "encourage" departments to work with him in relation to the intranet.

What does appear to be an outcome of this discussion on the resourcing role is that by using the intranet as a tool for supporting the curriculum, it can bring teachers and librarians into closer collaboration.

8.2.2.4 The need for leadership

Of the longer serving graduates it was obvious that librarian 8 had a very similar approach to resourcing as librarian 2, going out to departments and requesting project details. However at the time of the interview librarian 8 did not have the skills to create the intranet pages. Since then she has participated in the NOF training and in an email stated that she had created a library homepage on the intranet and was using pupils to help inspire ideas for it. However she also stated that she felt that very few people in the school were using it and that it had made little change to her role. This would appear to agree with what librarian 3 considered would happen. This was disappointing to the researcher who had felt that the librarian's active involvement in research projects and her confidence in making suggestions to teachers would enable her to take a prominent and more leading role in the intranet once she had the required skills. The librarian did give a reason for this lack of use – the fact that no departments had provided information for the intranet and so people thought there was very little information available and therefore did not look at it very often. This she considered would change once more departments were involved. What is interesting is that she is not saying that she will be encouraging or creating these pages for departments. She is waiting for departments to think of uses for their own pages, to create their own pages. So although she has provided some content, this on its own is limited and insufficient. There is no critical mass. Yet at the time of her interview she had talked of helping create instructional worksheets (non-html format) and of wanting to take on more of a role in promoting pupil research skills. What appears to be the difference is that what she has provided in the past has had a strong library context. She is not yet relating the intranet content from departments to the library context. There does appear to be a strong contrast with the role of librarians 2 and 5 who are involved in total intranet management and do not limit themselves to the library pages. As leaders for the entire intranet, even though they primarily focus on curriculum support they are “pro-active” leading the content development. Though neither describe it as such, both by maintaining momentum with the content are helping to encourage use by working towards this notion of “critical mass” discussed in the development of intranets section.

8.2.2.5 Librarians as specialists in searching

In Authority E librarians are selected across the authority as Internet subject specialists. This role appears to have been welcomed by all interviewed. In other authorities a number of ICT co-ordinators did not consider that the librarian should have a central role in providing URL support to teachers as they were not subject specialists (7, 10.12). It can be seen from the

findings that these ICT co-ordinators considered that departments would provide the URLs on their own intranet pages, not through links on library web pages. The reasoning they gave for this is that teachers are the people who know what is relevant. This appears to the researcher to be an argument which shows lack of understanding for the fundamentals of the librarians role; to support teachers and pupils with the curriculum. Teachers expect to find books to support the curriculum in the SLRC, why should they not expect to find Internet sites to support pupils work? If librarians provide newspapers, leaflets and other types of resources to support subject research why should they not provide URLs? In Authority E the decision to give the searching role to the librarians had come from a higher level within the authority and would indicate elevated status for the school librarians as searching specialists. It is perhaps because of this recognition by the authority that the role of the librarian has been highlighted and made visible to schools.

Could it also be to do with control of the intranet and an unspoken fear that librarians would take away some of this control from departments? There could be a power struggle question. The fact that Schools 2 and 5 appeared delighted with their school librarians and their intranet related roles would suggest that if there are such fears they are not beneficial to intranet development in schools. It should be noted that the negative view of librarians in relation to resourcing only came from ICT co-ordinators (although ICT co-ordinator 10 was not from the Computing department but a member of senior management). None of these negative attitudes occur in Authority E or indeed within the schools of the four recent graduates.

Librarians who had low involvement with the intranet still acknowledged that they had better search skills and knowledge of the Internet than many teachers (eg 1,6,7). But this is clearly not recognised by others in the school. The fact that the librarians in Authority E are able to be "experts" in searching for specific subjects indicates that the lack of subject knowledge is not the key issue. The essential part is being "expert" at searching. This is an information role clearly related to that of the school librarian.

8.2.2.6 Relevance of resources to the school

In the development of intranet section it could be seen that schools which emphasised quality, external content were slower in development (see eg head teacher 3 comments). Although there is certainly a need for quality content, School 2 highlights the kind of "local," "appropriate" materials for which a school intranet is ideally suited. The examples of the

instructional websites or mini-webs which use local resources, the librarian's knowledge of how this relates to the curriculum and the availability of teachers worksheets means that the material is appropriate and at the right level for the pupils concerned. By working in this way with teachers, this librarian is involved in providing pupils with structured learning activities relevant to their needs. Librarian 2 is "packaging" project material for pupils.

At the time of the interviews librarian 5 had not started developing such subject based instructional websites but he had structured his curriculum links to make them more appropriate to the different age levels of pupils. By preparing websites through evaluation, and making decisions relating to relevancy and age appropriateness, this librarian was providing a form of "scaffolding" for pupils undertaking research.

In different ways these librarians supply "educational" support, making this contribution "visible" on the intranet. This is an important point as to some extent it justifies the very technical roles which both librarians have undertaken. Their role in curriculum support has not been minimised but extended with the intranet. The authority interviews suggested that new graduates were lacking in educational theory and that this was a matter of concern. Yet the evidence from the research would suggest that these recent graduates through their involvement with the intranet have as strong, if not greater input in curriculum support than some of the longer serving librarians.

8.2.2.7 The position of the library in relation to school resourcing

It was difficult to find patterns relating to attitudes on whole school resourcing from the findings. It cannot be stated that the recent graduates are in schools where there is a better attitude to whole school resourcing. School 14 is very positive about whole school resourcing (due to senior managers personal involvement in the SLRC). School 13 appeared to have a good attitude to whole school resourcing, was hoping to have the catalogue available over the intranet soon, yet their librarian had very little to do with the intranet.

Many of the head teachers appeared to recognise that librarians are in a unique position, in that they deal with all departments. Although it appears that the intranets with the most varied range of content were those where the librarian was involved in a central way with the intranet management (eg School 2 and 5), there is little evidence that this potential for the role of the school librarian was realised by the other schools.

The electronic booking system for the library and the staff catalogue in School 2, provides evidence of how the intranet can make visible the library facilities and increase use of resources.

8.2.2.8 Lack of role in relation to online subscriptions and CD ROMs

One of the surprising findings of the research was that librarians were not involved in providing online resources. In addition many of the librarians had limited roles in CD ROM provision. The reasons behind the online resourcing were lack of finance from the schools (and the authorities). The CD ROM provision was slightly more complex. In some cases the authority appeared to have some influence, through providing CD ROMs via the Managed Service Provider. The decision for some purchasing was then taken from schools to the authority. In other circumstances there appeared to be an individual school decision as to who historically purchased and maintained CD ROMs. It is evident from the findings that many schools have not made whole school decisions on individual purchases and that a culture of "departmental" holdings had been allowed to grow. It is interesting to note that one school where there was positive discussion of whole school purchasing was a school where the senior manager had been involved in buying and installing the library management system and was aware of its capabilities for whole school resourcing (School 14). It cannot be said that the intranet is a tool which has enabled librarians to develop their role in providing access and support to CD ROMs and online subscriptions.

8.2.2.9 Access to computer resources- managing and supervisory roles

The visit to School 6 emphasised another aspect which appeared to have some bearing on the role of the librarian. This was the first school which had an extensive computer suite as part of the SLRC (see Appendix 21). But the effect on the librarian's role appeared to be negative. Despite the librarian and head teacher talking positively of the presence of computers, under questioning it was clear that these computers contributed very little to the "professional" role of the librarian and there was little to connect her to a role with the intranet. This is because her role in managing the suite is related to the librarian taking bookings of classes who come with a teacher who then proceeded to take the lesson. Librarians 7, 13 and 14 also have large computer suites and all have a role in managing access.

Librarian 13 expressed concern with the supervisory role. This took on extensive, time consuming proportions as librarian 13 had to administer individual passwords to allow pupils

onto the network. A large number of computers may demand a supervisory role of some extent. Although all librarians take responsibility for the pupils in their SLRC, this example appeared to require supervision beyond the capabilities of one librarian in a very large library. However it could be argued that Schools 7 and 14, both with extensive suites should have faced similar problems (although School 14 has a library assistant). Neither librarian raised supervision as an issue of concern. In contrast there was plenty of evidence from these interviews that they had more direct "tutorial" involvement with groups and individuals using the suites beyond mere supervision.

The number of networked computers in School Library Resource Centres will increase (Appendix 21). As other librarians extend their computer collection, this may well mean more librarians increasing their supervisory role.

Librarian 3 complained that lack of access to networked computers restricted her from developing the intranet further as limited machines in the SLRC meant that few pupils were able to access resources at the same time. Librarian 12 lacked access for himself which was restricting his ability to create content. It would therefore appear that too few appropriate machines could also affect the librarians' ability to contribute to the intranet.

8.2.2.10 Explanation of the resourcing role

The key to understanding the resourcing roles undertaken by recent graduate librarians 2 and 5 would appear to be related to the fact that as recent graduates they had the "confidence" to make "visible" their work on the intranet. By making "visible" this resourcing role it was a natural extension to go beyond mere URL support, to provide more structured resourcing support and to create the content for all school departments. Although they were able to do this because of their interest and skills and due to the "power vacuums" - the real value came from the "relevancy," the "content gap," and the shared curricular support which they as librarians could contribute. For longer serving graduates there was a tendency to want to restrict the librarians involvement to within the confines of the library, and to wait for others to lead change. But by doing this they were not promoting the SLRC nor the intranet as relevant to whole-school resourcing.

As with the technology roles the visit to School 15 was used to investigate this explanation further. Going by the above discussion it would be expected that as a longer serving

graduate, librarian 15 even with good ICT skills would only be responsible for the library pages.

Until recently this was true. Departments, as stated in the findings, were responsible for their own information. Unlike most of the more recent graduates who started with URL links to support subject areas, this librarian had followed the pattern of older graduates by keeping information about Internet sites in project folders. What he provided on the intranet was his own information skills programme as a prime example of an instructional website using Internet resources and CD ROMs. He also developed specific instructional websites with departments (eg Geography). It was only recently that the librarian himself had provided URL support built into web pages appropriate for a range of subjects. This was through the instructional website on the theme of "Issues" used for discursive essays and most importantly through the homework pages for all departments.

This librarian did not have the initial control of building the intranet, nor would it seem that he had the confidence to put himself into that central position where the library pages were the main curriculum resource support for the whole school. He had stayed within the boundaries of "control," limiting his input to directly relevant library projects. It is the input into the homework site which would appear to mark that change.

What then is the explanation for the librarian's role? It has already been discussed how the librarian did not have control, but had the skills and confidence. If we go back to the content "gap" explanation, it did not appear to be lack of uptake by others which was important, as there was plenty of evidence in this school that departments were creating their own web pages. These web pages were often of an instructional nature, albeit created with the librarian's cooperation. But in this school it is related to being central and dealing with all departments. As discussed in the development of intranet section the major difference is the relevancy of the librarian's contribution to resourcing. It appears clear that the librarian's involvement comes from knowing what projects are being undertaken and what resources can support that project or piece of homework. As suggested with librarian 2 it is from seeing the potential and being creative with the resourcing role. However it must be underlined that unlike librarians 2 and 5, librarian 15 was not creating all the content. This is quite different to what was happening in those schools. School 15 indicated that where staff had the interest and the skills they were capable of operating as independent content creators themselves. In School 8 no-one else was creating content and so the librarian's efforts had a

limited effect. Librarian 15 was more active in encouraging others to create content for the intranet.

There is also the question of the time, the flexibility and the willingness of the librarian. Again there is evidence that these are key factors in explaining the difference between the ICT co-ordinators roles and those of the school librarian. Librarian 15 initially responded that it was his experience and relationship with staff which led to this role. Although important his acknowledgement that others in the authority had similar educational experiences but were not involved in intranets, indicated that it is the technical ability and interest which was more significant in defining the role. As with librarians 2 and 5 there was evidence of educational relevancy through supplying age appropriate materials and educational resources which were not available elsewhere (eg in the New Lanark project, which the school developed by using their own photographs and educational materials).

Although librarian 15 had not "led" from the front by developing his own pages as central, he had "led" by encouragement of others to contribute to the intranet. Librarian 15 did not technically create all the content himself but encouraged teachers to develop skills to create their own pages. It is only within the homework pages that he in any way manages information for all departments. His content provision is directly linked to projects which make use of the library or information literacy support.

8.2.2.11 Conclusion on resourcing role

It can be seen that school librarians can have a central role in providing resource materials and curricular support on the intranet. This is because they

- deal with all departments in the school
- know what projects and curriculum support is required by departments
- are in a position ready to extend the curricular support they already provide to include web related materials

This "relevancy" and "centrality" is the main explanation for the resourcing role in relation to the intranet. The intranet is a tool which can enable librarians to make visible their resourcing role, providing they have the skills and confidence to do so. It is also clear that the resourcing role is related to seeing the potential and encouraging others to contribute materials. This is important for developing a critical mass of content as discussed in the section on development of intranets.

8.2.3 Instructional role

The "causal" statements clearly identified a divide between the recent graduate librarians and longer serving librarians in relation to the intranet and the technical and resourcing functions of their role. On the surface this divide was less clear-cut within the instructional remit of the school librarian.

8.2.3.1 Information skills support to pupils

There was evidence that interest in information skills was something which concerned all librarians in the research and that many of the longer serving graduates if they had not already included ICT, had planned changes in the future to include these in their information skills provision. As schools have become networked and there is an increased need for ICT skills there does appear to be conflicting evidence concerning the librarians' role. In some cases the role of the librarian as whole class information skills instructor had diminished as ICT was dealt with in new courses (9 & 14). In School 2 the librarian herself had cut back on her formal information skills course to S1 to a basic four lessons but essentially included the Internet and CD ROM. However this decrease in formal timetabled classes allowed greater flexibility of time and an increase in input into the instructional websites for pupils' research as discussed in the previous chapter. And in addition librarians 2 and 5 were increasing their information skills to other year groups to include ICT.

There did appear to be some evidence that the intranet/Internet highlighted the need for information skills. Lack of information skills in senior pupils was mentioned frequently in the interviews. It was often the senior pupils who with more free time had access to the SLRC and the Internet. Librarians talked of the increased time which they had to give in providing one to one support, helping individuals. There was limited evidence in the data from teachers for the librarians to take on an instructional role in whole class ICT. Where teaching staff promoted the librarian's role, it was in this less formal supporting of pupils as they were in the SLRC working on computers (eg Schools 3, 4). It was noticeable that this was emphasised as a very important role by a number of head teachers.

Two librarians in particular made reference to their role as informal information skills support. For librarian 8 it was a question of access in that she felt the SLRC was one of the few places where pupils were actually allowed to use the intranet. She indicated interest by providing lunchtime workshops, where pupils would have the opportunity to undertake Internet searching but would also have support from herself. Librarian 9 was equally keen to

provide pupil access to the Internet. The support by both librarians was seen as an extra to the ICT provision within the school timetable.

The intranet can provide a possible "strategy" for improving pupils' ICT skills. There was limited evidence from the longer serving librarians of viewing the intranet as such a tool with the exception of librarian 3 who suggested the possibility of hosting an information skills course for senior pupils to work on in their own time. Of the more recent graduates only librarian 2 provided all her information skills course on the intranet, with librarian 5 some information skills work and librarian 12 considering this. Librarian 12 was using his intranet homepage to identify two search engines which he felt were particularly suited for pupil searching and which he was advising pupils to use. Librarian 5 had provided an instructional website for pupils using "Microsoft Word" and who wished to use advanced facilities to improve their presentation.

Despite the concerns raised, librarians on the whole had not addressed the question of research support for pupils who come out of class to use ICT in the SLRC. By putting specific search engines on the library homepage on the intranet librarian 12 provided a basic support for pupils who may be searching unsupervised. Other than librarian 2 none of the librarians talked of having information sheets available within the library or supplying general skills information on their intranets (eg on search strategies, note-taking, how to take references from the Internet). Where the librarians are clearly supporting information literacy is with the search skills on the Internet and supplying structure to pupils searching appropriate to their age group (eg librarian 5 and 15). School librarians would not shelve books according to age level - but then they would be available to advise and recommend as pupils check these out. However within an intranet environment much of the use of information on the intranet takes place in the classroom, out-with the librarian's control.

In Schools 2 and 5 it was mentioned how the information skills provided by the librarian involved senior management support. Depute head 5 talked of the "strategic planning" necessary to increase the range of information skills to different year groups. The development plan from librarian 2 clearly provided evidence of involvement of senior management. However librarians 2 and 5 were still providing the information skills course on their own as opposed to working in cooperation with teaching staff. School 9's whole school policy appeared to have lessened direct involvement with the librarian. Although he was building the intranet, utilising it for information literacy support was not amongst any of

the aims discussed by the librarian. A number of librarians were providing information skills support (eg 1 and 8) without any strategic involvement of senior management.

The main reason provided by the librarians themselves for not using the intranet for supplying information skills support was the lack of time to develop these courses or materials. Yet librarian 12 had only been in the post 6 months and had immediately adapted the information skills course to include ICT and was looking to put this on the intranet. Librarian 6 had been in post for many years but did not yet include an ICT element in her information skills programme. Librarian 2 was using the intranet for information skills support before having an auxiliary, whilst librarians 3, 4, and 14 with library support had not made the same progress. Some SLRCs just did not have enough machines in place to support a class working on an information skills course. Lack of space meant that Schools 3, 4 and 9 were unlikely to have the facilities for this to be possible. However simply because the machines were in the SLRC did not necessarily mean that they were being used by the librarian as part of an information skills course (compare School 2 with School 6). The SLRC facilities are irrelevant for if the information is on the intranet it can be used anywhere in the school. It can be seen that where URL support was the first line of provision on the intranet from the recent graduate librarians, information literacy support was some way behind. This research suggests that the reasons for this is not related to access to the technology alone but may be partially explained by the time required to develop and adapt courses, the need for some whole school support and the confidence and skills of the individual school librarians.

8.2.3.2 The role of librarian as staff trainer

The role of staff trainer was also confusing. The limited number of librarians providing formal training to staff was not purely due to the skills of the librarian. There were at least three librarians who had the ability to train staff in ICT but who did not do so. School 5 had a very ICT literate librarian. Librarian 8 showed evidence of confident ICT skills and had given other general in-service training to staff but not in the skills for using the technology. Librarian 9 had previously demonstrated the Internet to staff when the SLRC had been the only access point in the school and had also demonstrated CD ROM use on a stand-alone machine. These three librarians were not currently involved in staff training. There were a number of possible reasons for this. There does appear to have been limited internal ICT training of staff in schools in general so the possibility of being involved may not have arisen (no internal staff training in Schools 5 and 8). At the time of the interviews most schools

were still waiting for the NOF training of teaching staff to take place. The politics of school departments where Business Education and Computing staff are viewed as subject specialists may also be a factor. In general librarians are rarely involved in providing training opportunities to staff and so may not be considered by teachers when planning in-service training days.

Only in two schools did the ICT co-ordinators talk of the librarian's role as staff trainer. In School 2 the librarian had worked with the ICT co-ordinator during lunch hours and this had been increased as the librarian officially became an NGfL "mentor." In School 12 the ICT co-ordinator was keen to involve the librarian in training staff. In both these instances it appeared that the librarians' relationship with the ICT co-ordinator and their knowledge of the librarians skills was a factor in the staff training role. Both were recent graduates and both were very confident about their ICT skills despite being different character types. An interesting point was made by librarian 2 that staff often preferred to ask her for help, rather than the Computing teacher. She talked of how she was "less threatening." It also has to be said that staff are used to asking librarians for help. That is part of their supporting role in the school.

8.2.3.3 Explanation of the instructional role

It appeared that most librarians were concerned with information skills, including ICT skills. In the first instance elements of ICT skills, eg searching the Internet or CD ROMs will be provided within library information skills courses where these exist. Librarians who are creating materials for the intranet may consider providing guidance on search engines and their own information skills work on the intranet. However using the intranet for information skills support is likely to be a longer term goal, which in addition to the necessary ICT skills of the librarian, may require time. Librarians may be involved with staff training if they have a good relationship with the ICT co-ordinator, are recognised within the schools as ICT skilled and if the school has a policy of internal training.

How does School 15 relate to this? Firstly this librarian had a high level of involvement in staff training, but in a different way to librarian 2 who provided her training through workshops. Librarian 15 was involved in more individualised training to members of the teaching staff. The reason he gave was that through experience he had learnt that this was the best way of encouraging staff to use ICT. There did appear to be a different agenda in that his training was not simply about providing ICT skills, but was more about encouraging staff

to acquire the skills in order to contribute to the instructional materials on the intranet. This related to the librarian not being seen as the main “intranet manager” but having a more informal role in encouraging intranet use by departments across the whole school (and towards contributing to the critical mass of materials).

As with most of the other librarians, librarian 15 only addressed formal information skills to S1 pupils. It was a particular library course on a theme to which he had added ICT elements. The librarian had not developed tutorials to support information skills for older pupils. Although as in School 2, all pupils could look at this course on the intranet there was not a dedicated section on information literacy support. Like a number of the other librarians, librarian 15 was also concerned about pupils free searching. His strategies were the evaluated websites and use of an appropriate search engine at the front of his homepage. However the Issues instructional website can be seen as a change of focus for information literacy. It was the teachers who were also providing information literacy support, through the directions on how to write a discursive essay, the information on referencing etc. This is taking the information skills support to a level beyond what appeared in the other intranets in Scottish schools. What is the explanation of how this librarian has been able to do this? It does seem that it was the next step on from previous instructional websites, which included teachers’ worksheets. In this case his response on his educational experience and his relationship with teachers would appear to be more significant. In the first instance it was the teachers who were supplying the information literacy content, although he may have made contributions and given advice on what was useful. If he had no history of involvement in ICT projects on the intranet it is unlikely that he would have become involved in this way with the teachers in providing the information skills support. It is important that the librarian is doing this in cooperation with teachers as this ensures the validity of the support he is supplying. It also means that the material is appropriate for pupils and will be used by pupils.

8.2.3.4 Conclusion on the instructional role

Librarians use a variety of strategies to support information literacy. The content of the information skills course provided by librarians is likely to be developed solely by the librarians and be limited to specific courses. Those using the intranet do seem to view it as a way of expanding courses to other year groups and of structuring use by encouraging specific search engine use or evaluated websites. Using the intranet as a whole school information literacy support takes time, and will be dependent on the ICT skills of the librarian, teacher cooperation and may be related to the experience of the librarian in relation

to instructional website development and knowledge of the intranet as a potential tool for promoting information literacy.

Involvement in staff training will be dependent on the ICT skills of the librarian, the relationship with staff and the in-school attitude towards staff training.

8.2.4 Literacy Support

As was shown in the findings librarians were using the intranet to promote literacy. It is important to make this point because it shows that they are using technology to maintain what is considered as one of the more traditional roles of the school librarian. There is potential for a variety of literacy projects from reading databases for fiction (2, 15) to pupils writing their own reviews (5) and publishing their own poetical works (5). Two of the longer serving graduates also talked of the potential of reading support (3, 11). Although skills to develop content once again are paramount, the particular forms of literacy support appeared to be up to the interest and knowledge of individual school librarians. The important point is that librarians including the more recent graduates are not neglecting this area.

8.2.5 Factors to be considered in understanding the role of the school librarian

8.2.5.1 Senior Management Support

The question here is whether senior management support is critical to the specific roles in relation to the intranet. The answer would have to be no. In the leading schools, only librarian 2 had a great deal of support from the senior management and this gave her time to work on the intranet. None of the other three leading schools had senior managers who "motivated" the librarian to be involved in the intranet to the same extent. The management were supportive of their librarian in School 5, but it is also evident that they have had no real influence, gave him free reign and had not by any means "driven" his role in intranet development. The deputy head himself commented that he was aware that the librarian would criticise the management for lack of direction. In School 9 the senior management were against developing a website and had shown little inclination to do anything with the intranet. Librarians 5 and 9 have taken on their roles not because of senior management support but despite lack of interest from their senior management. And in School 12 the drive for the intranet by senior management had been directed towards other staff in the school. As stated previously there was some evidence that senior management can have an influence in the information skills policy in the school and on the role of the librarian within that. However it was also evident that many of the information skills courses were library

based and were developed with no support from senior management. In conclusion it is found that senior management support was not a major factor on the role of the school librarian in relation to intranet development.

8.2.5.2 Authority influence

As has been discussed the authority influence can have an effect on the role of the school librarian. The decision to have a Managed Service or ICTO may affect whether librarians have to share network administration roles. The appointment of school librarians as subject specialists appeared to have an impact on the role as it raised awareness of the role, raised the status of the librarian and led to new professional career opportunities through secondments.

The third authority which had three schools is Authority C (Schools 7, 11, 13). There appeared to be little positive influence in this authority as none of the three librarians had major involvement in the intranet. And none appeared aware of schools in the authority where librarians were leading developments. There was no "visible" example for teaching staff to look at. This could partly explain the negative attitude to the line of questioning from ICT Co-ordinator 7 and 11. Yet of all the authorities visited, this authority had more central School Library Service support than any other. There appears to be a number of working groups for librarians, including an ICT group. Two librarians did not mention the ICT group in the interviews and when questioned were vague on what it was doing. None of the librarians make significant use of emails to discuss issues within their School Library Service. This authority had the most extensive of all authority intranets and had spent a great deal of money on it. Money had provided content and supplied technicians to support the service. But there had been no consideration given to the possible involvement of librarians at the higher levels of management within the authority (as compared to Authority E) and this also appears to be significant. Authority E indicated how influence from the Director of Education and from the School Library Service can clearly raise status and expectations for school librarians. It is important to make teachers and other groups aware of what is happening within the School Library Service. For Authority E this entailed secondments for school librarians, something which in itself is unusual within the school library community in Scottish education. There was huge potential in Authority C for school librarians to make a significant contribution but unless it is recognised by those in charge of the intranet, then there is a danger that much of the work of the school librarians will be kept to within the School Library Service (invisible). Most schools in this authority use the same computerised

issue system in their libraries. School 13 talked of how they were going to put it on the intranet once licences had been acquired. There was no discussion of this in Schools 7 or 11. Either it was not so straightforward as ICT co-ordinator 13 expected or it was not an issue that was being encouraged from above by the authority or School Library Service. In School 7 the librarian had shown the researcher a folder of reviews written by school librarians across the authority and used by Higher English classes for selecting books for personalised reading. Every School Library in the authority had this folder. There was no suggestion by librarian 7 that she was interested in putting this material on the intranet nor mention by librarians 11 and 13 that this was something which the authority at this time were considering. And yet this is a prime example of work which would be ideal for the school or authority intranet. Contributions came from librarians across the authority indicating that it is possible to produce quality content of value within the authority. But as it is kept in folders in each library it can only be used by limited pupils at a time and only when they are in the library. As this authority had a developed intranet it is disappointing that none of the school librarians could demonstrate to the researcher that the School Library Service had any presence within this.

By comparing the positive moves in Authority E with the lack of involvement in Authority C this indicated to the researcher that involvement of the School Library Service and authority support can be important in contributing to the role of the school librarian in relation to intranets. However the mere presence of a School Library Service in itself is not significant.

8.2.5.3 NOF training

Not all school librarians had completed their NOF training at the time of the interviews. Follow up emails indicated that NOF training appeared to have had little effect on whether librarians have had any role in the intranet. Yet the NOF training included elements (eg on intranets, creating web pages and presentation software) which would be useful to any librarian considering managing the intranet, creating basic web pages or involved in developing instructional websites.

8.2.5.4 Gender

Despite there being more male librarians involved with the intranet in this research the gender of the librarian is not considered to be relevant (see Appendix 19). Librarian 2, a female had one of the most extensive roles in intranet development whilst librarian 13 who was a longer serving male had little to do with the technology. In that three of the four recent

graduates were male, this research did appear to indicate that there may be more "younger" males attracted to what in Scotland has been a very female dominated profession.

8.2.6 Conclusion on the role of the school librarian

From the above discussion it is clear that the longer serving librarians were not "initiating" these role changes into the technical side, had more interest in resourcing and in providing information skills. Over time some librarians have taken on roles which are different to others: librarian 10 as Study Support co-ordinator, librarian 8 as Homework Support, librarian 1 as Project Co-ordinator for a CD ROM evaluation with a major university, soon to be in charge of a Flexible Learning Centre (see Appendix 16). All of these roles can be seen to be central roles which have come from the librarian being in a central position dealing with a range of departments. All, in some way are related to an aspect of work in which the librarian is already involved (eg librarian 8 with information skills, part of the Homework Support). There could be other roles for school librarians which the researcher did not uncover. It does appear that there is flexibility within the role of the school librarian and that there are a number of routes which librarians can take.

What is obvious is that the more recent graduates are taking routes which involve a high level of ICT. And within schools which have intranets, it is natural that they should make moves to be involved with these. Since it was possible to compare schools within the same authorities which had the same support systems and intranet technology it is evident that it is the individual differences relating to the school librarian which have proved to be the most significant in explaining the extremes of roles undertaken. Although the more recent graduates are more likely to become involved with intranets it is evident that skills and attitude are the most significant factors.

Involvement in the more technical role of intranet building and intranet management will be up to the organisational structure of the school/authority, attitudes of staff (power gap) but above all the individual characteristics of the school librarians (skills, confidence, willingness). But it is the resourcing role of content creation and instructional literacy support where there is real potential for the school librarian. This can clearly encourage relationships with teaching staff, promote the role of librarian as resource specialist and see the school librarian with a substantial and meaningful role in providing educational support to pupils.

One of the key words used to describe librarians was that of "willingness." This is the ability to both build relationships with staff and to become involved in new challenges. There is evidence that they must be willing to try new ideas, to constantly improve their ICT skills, to be able to self-train, not to wait until the training is forthcoming, not to wait until every aspect of a project is perfect, but be willing to "go" with it. A large part of this is accepting that the intranet is a tool which can promote their skills and services to the school.

8.3 Recommendations

Key recommendations are made in relation to the development of intranets and the role of the school librarian.

1 Local education authorities should

- Identify examples of good practice from schools leading intranet development
- Make these examples available to other schools in an attempt both to encourage the sharing of resources between schools and as a way of providing an example to kick-start intranet content
- Encourage and support schools (financially) to continue informal ICT in-service training within the school.

2 Schools should

- Identify staff who could act as “activators.” These staff should have the ICT skills to create content pages for the intranet, they should have the time to do this and they should be willing to encourage staff across subject departments to contribute to the intranet
- Ensure all staff have regular access to computers
- Provide curricular content quickly. The most efficient method of encouraging content of immediate value is to provide curricular links to the Internet for in-school projects. Further examples of curricular content could include teacher cooperation with school librarians to identify key research projects involving large groups of pupils. These could be developed into instructional websites. A target of one or two projects per year would be a way of kickstarting intranet content which is of immediate practical use. It is of relevance to both teachers and pupils, and therefore provides the intranet simultaneously with a critical mass of users and content.

3 Scottish education should

- Consider reporting systems which could be made available to schools to run on local intranets. Many schools are spending a great deal of time on this and thus some national development in this area would be deemed of value.

Recommendations in relation to the role of school librarian

1. Training issues for school librarians

- Need for ICT training to build on the skills provided through NOF
- Need for training of school librarians to tackle the problem of “confidence” in longer serving staff
- And need for training to look at finding practical solutions to the problems of lack of cooperation/collaboration between teaching staff and school librarians.

2. School Library Support Services should

- Consider optimising authority intranets/ websites in supporting their school librarians
- Consider the sharing of resource related materials already available in paper format within the Authorities (eg the senior fiction support, local information skills programmes).

3. Local education authorities should

- Consider collaboration with School Library Services in providing curriculum support to schools
- Consider seconding school librarians or ICT co-ordinators to kickstart authority intranet development. Curricular links for projects or local archive material of curricular relevance could be a starting point for this
- Ensure adequate ICT support for School Library Resource Centres set up as a central ICT resource and consider extra training for school librarians as required.

9 Conclusion

The first part of the conclusions compares the findings and theory to the literature review. The second part focuses on how the research objectives have been met and concludes by considering areas for future research.

9.1 Synthesis with the literature review

This research has found that intranet development in schools has been organic in nature. Schools in general have not started out with a clear purpose for their intranets. It is through use, through individuals giving direction and, through examples and suggestions that a purpose has been developed. And there is potential for this purpose to change. As discussed in the findings this is in keeping with the idea of an intranet as an “emergent” technology (Damsgaard, & Scheepers, 1999, 2000). There is also evidence that unless content continues to be encouraged on the intranet, then it will stagnate and be slow to develop (Damsgaard, & Scheepers, 1999, 2000).

How then are schools to support intranet development? The findings of this research suggest that schools require a supportive management, where key individuals are able to expand or take on new roles, and to be creative with what they are doing. None of the leading intranets were found to be in schools which were directive or in authorities which were directive. This is in keeping with Senge’s key argument that centralised leadership is no longer possible and that everyone is a learner (Senge 1992). Senge outlines five disciplines as his strategies. What these provide are an open structure, which is committed to personal learning, team learning and shared vision. This research indicates that schools which have made progress with their intranets, have that open framework, where new ideas can emerge and be followed through, where a culture of sharing of materials is encouraged, where individuals have been positive and welcoming of new ideas, where individuals have been able to make and take suggestions and been prepared to learn from each other. There is also evidence of the need for qualities identified with those of the school as a learning community (Retallick 1999). In the leading schools there was evidence of a receptiveness to ICT, of ICT use across the school, and an emphasis by content creators on constructivist content. An important element was that the schools took responsibility for attempting new challenges and leading change from within. These characteristics are also applicable to authorities who themselves require to be willing to share ideas, experience and use the talent within.

In Senge's organisation people view themselves as connected to each other. In the schools and authorities in this research connecting is a key element. Staff have to connect with each other to share ideas. But the intranet has also become a focus for connecting.

Content must be relevant to the mass of individuals using the intranet (ie pupils and staff). This is where the development of intranets in schools varies from the development of intranets in organisations. They both require content which is relevant, but in schools it must be specific to the educational context and thus relevant to the teaching needs of the school. This is likely to be in the form of evaluated URL support. These can quickly and easily be created for the intranet. Schools which moved to focus on curricular support for their intranets, progressed their intranets much quicker than those which focussed on information gathering. This third stage identified as the "individual intranet" and of an interactive nature is key. Schools should aim to progress to this stage as quickly as possible. In organisations less emphasis has been placed on the interactive stage, with more emphasis on gathering a mass of content (interactive or not) and users at an earlier stage. School 12 which focussed on flat content information did not develop at the same pace as schools with evaluated URL project support. It is the relevancy of URL links to pupil projects, meeting an essential educational need which appears to have an immediate positive effect on the school. Once content for many users is provided this will encourage further uses and is likely to lead intranets in more diverse directions relating to individual school identities. The emphasis on curricular material and specifically on URL support sees the intranet as supportive of constructivist learning. The materials have been evaluated and are there to guide students and provide the "scaffolding" as they use them in homework and projects.

The evidence of this research would suggest that intranets have not yet been affected to any great extent by the changes to the Scottish curriculum, despite ICT being a core skill in the new Higher Still. There is some limited evidence (School 15) of the potential of homework and supported study to be developed on the intranet and websites. But it is also clear that homework and parental involvement is an aim which is some way off for most schools. These potential uses are the ICT developments which grabs headlines. This research would suggest that the internal worksheets and URL support are the bread and butter of school intranets which are essential for making the intranet relevant to all departments. It is the educational relevancy which leads to the critical mass of use. For this reason schools will want to develop their own internal intranets rather than rely on access to authority intranets. It had been expected from the literature review that the Scottish VTC would be an area of

support. There was a surprising lack of mention of the VTC. But this does fit in with the theory that content requires to be internalised to be of value.

The lack of use of intranets by management in this research confirms the suggestions by Visscher (1997) that there may still be a reliance on verbal information in making management decisions. Although use was made of email for communicating papers, this was more in the style of background information. Head teachers emphasised the continued need for discussion.

Despite the fact that many schools have been provided with intranet technology at a similar time it can be seen that the speed of development has differed. Those interviewed at authority level had suggested that this would be the case. The technicist approach saw the technology going into schools at the encouragement of government and authorities. Yet within the schools much of the development has occurred in a decentralised manner, from a bottom up approach. This bottom up-approach was similar to the early stage of intranet development in organisations. Damsgaard and Scheepers (1999) found that a key feature of intranet development identified in their research was mobilisation (encouragement) in the early stages and innovation directives (at a later stage). These are similar to the sociocultural factors of Breu, Ward & Murray (2000). In schools the intranet development never progressed to later stage directive strategies. The more developed schools were encouraging the intranet, but not through active examples of workshops and training for all staff. Where the encouragement took place it was in a decentralised manner via informal meetings, suggestions and examples. None of the schools in this research could be said to be directive in this matter ie running campaigns, competitions, posters etc to entice staff to use the intranet. This again is due to the bottom-up intranet development in schools which was led by individuals who did not have the power to instigate such campaigns. Rightly it was acknowledged that access was still a problem but this research would suggest that the culture of the school community would not take kindly to some of the directive strategies where for example they are forced to use intranet bulletins instead of daily printed notices.

Individual roles were identified as important and as in the literature on intranets in business there does appear to be new roles. However the intranet roles as discussed by Damsgaard and Scheepers have not developed in the same way. The role of the "sponsor" as someone who "sold" the intranet to the management during the initiation stage of development is not found to be significant (Damsgaard & Scheepers 2000). The role of "promoter" as used in

their second stage was also not found to equate to what was happening in the Scottish school system. But the identified roles of activators, mediators and to a lesser extent gatherers are considered important to developing the critical mass of users and content.

This research has clearly identified some technical roles for the school librarian in Scotland which goes further than what the UK literature on school librarianship has suggested or indeed what the interviews with the School Library Support Services or education authorities expected. This indicates that some Scottish school librarians are actively stretching their roles and are at the cutting edge of change in school librarianship. References to the roles of building, of managing and of content creation can be found in the Australian literature on school librarianship. However there was no evidence of school librarians being able to use their library management system on the intranet to operate as whole school information providers. The school librarians in this research may not have had management systems which could cope with operating on an intranet but it also appeared that a change in attitude to whole school resourcing by teaching staff would be necessary for this to happen. There was no real evidence that school librarians were using the intranet to inform staff in terms of current awareness as suggested by Herring (1988). And Scottish school librarians do not appear to have a central role in electronic information support through online subscriptions and CD ROMs and therefore are unlikely to become directors of information services as suggested by Lee (1996). The suggestion made by Loertscher (2000) of the school library with the elastic collection still appears some way off in Scotland.

School librarians may have to be more "proactive" to make the most of their school intranets. They must make the effort to suggest and provide the links. This is not dissimilar to the research on librarians in organisations where the librarians can be seen to be targeting internally generated materials and making them available in a new way (Hall & Jones 2000). For some of the school librarians in this research the Internet and the intranet has meant an extension to the evaluating and bookmarking of resources, this being their traditional collection function (Dow 1999). There was some evidence of school librarians "packaging" (Debowski 1997) information using local materials and data (Donham 1998). As suggested in the literature school librarians were using these in addition to their print collections (eg vertical files see Woolls 1999).

Wake had suggested the intranet potential for information literacy (Wake 1999). In the one school where progress was being made in this, it was the teachers who were providing

information literacy support, through the directions on how to write a discursive essay and the information on referencing. This does not appear too surprising to this researcher as Scottish school librarians do not have teacher qualifications. But there is clearly evidence that school librarians are interested in information skills and see it as an important part of their role. Significantly the more recent graduates displayed that they also were keen to work closely in cooperation with teachers. The isolation of some of the longer serving graduates was not seen in discussion with the more recent graduates.

In studying the development of intranets and the role of the school librarian it can be seen that it is the skills and attitudes of individuals (individual characteristics) in both cases which are the main factors. Following this at a further stage, the culture of the school becomes important, specifically receptiveness to ICT innovation and relationships with other members of staff (human relations). In the case of the school librarian there is also evidence that relationships with individuals and groups is important (human relations). In order for cooperation to occur and for staff to know what the librarian can provide to support them the ability to form relationships is essential. These personal characteristics are in contrast to what the school library officers suggested would be key barriers to involvement in intranets (organisational factors, supportive management, time, etc). The literature on librarianship had suggested that the support of senior management of the school could be critical to the role of a librarian (eg Henri, Hay & Oberg 2002). However this does not appear to have been supported in this research. Is it essential that the librarians are "leaders" of change? It does not appear that they must be dynamic. It has been shown that in Scotland they need not "lead" from the front but can work proactively from within their traditional information management role of curricular information provider.

9.2 Meeting the research objectives

9.2.1 A predictive model of intranet development in Scottish secondary schools.

A model has been developed specific to the context of intranet development in Scottish secondary schools (see section 8.1.23). Schools using this model should be able to identify at what stage they are at in their intranet development and to further identify criteria necessary to progress that development. Importantly the necessary key roles with associated skills and the significant content to progress that development have been identified.

This model has some overlap with the models on intranet development in organisations. The specific dynamics of the educational context make it unique. The model changed and adapted as new schools were added. This model was based on the findings of the fifteen secondary school which participated in this research but has not been further tested nor commented on by those in the field.

9.2.2 Identification of the key roles for school librarian in relation to intranets

This research has clearly identified a range of potential roles for the school librarian in relation to the intranet; intranet builder, intranet manager, network administrator, technology support, content creator (Internet searcher, instructional website developer), information skills support and training support. It is not expected in any way that librarians should take on all of these roles. What has been identified is that the role of URL support and content creation in relation to project work is important. Although some librarians may wish to be involved in the more technological intranet roles (activators) these are not essential. There is room for diversity. This research indicates how the mediating role, utilising the resourcing skills of the school librarian can lead to increased teacher- librarian cooperation and provide the librarian with a central role in intranet development. It is a role of real educational value within the school.

9.2.3 Education and training for school librarians

In the explanation of the roles of the school librarian it was noted how recent graduates were taking on ICT (and intranet) roles which were generally not taken up by longer-serving graduates. In talking of the future it was clear that this divide in roles was going to continue as those already involved wanted to build on what they had started. This obviously raises concerns that Scottish School Librarianship will become a divided profession. Schools 5 and

9 clearly wanted any new librarian to take on similar roles to their current librarian. Unless there is continuous ICT training and constant communication and awareness raising then a divide is likely to happen.

The need for school librarians to be further trained in educational knowledge has not been supported by the evidence of the respondents in this research. However there is still a gap between what the potential of the literature review was suggesting in relation to information literacy and what the more recent graduates were providing. Given more time it may be that these recent graduates may go on to provide the kind of literacy support as seen in School 15. It may also be that the information relating to the kind of instructional projects in which librarian 15 was involved, needs to be publicised within the school library community. With the lack of guidance for leaders in the field and the need for structure and support amongst many of the “longer serving” graduates then this would be helpful.

The specific ICT skills which would appear to be most helpful are those of the reinforcement of searching skills, evaluating skills and web creation skills provided by NOF training. The NOF training must not be forgotten but built upon otherwise it will have had little value. Where School Library Services exist it could be possible for these to look at librarians operating as ICT leaders and use them to provide examples of their work and to lead training sessions within their own authority. ICT skills in relation to specific instructional website projects would be useful. Although most of the ICT leaders in this research have proven technical support skills, these in themselves are not necessary for searching the internet, evaluating websites or content creation, which is where librarians show the greatest curricular support. However they may be helpful in dealing with confidence in ICT.

This research like previous research in school librarianship has touched on the problem of isolation. The issues of confidence and attitude are more difficult to overcome. This is particularly concerning in a number of longer serving school librarians. Practical solutions need to be suggested if the divide is not to continue.

One of the themes which kept appearing in the analysis was that of visibility. From the ICT co-ordinator responses in particular it was obvious that they lacked knowledge about the role of the school librarian. The authority intranet officers were unsure of the role. This may well apply to many teaching staff who do not regularly use the library system. And some library staff clearly felt that teachers were unaware of what they provided. The intranet is a tool

which can make visible the work of the school librarian. Librarians themselves need to take some responsibility for their invisibility and to do more to promote their role. For this, training in promotion and public speaking to help with confidence would be useful.

9.3 Suggestions for further research

There was a limitation to this research on intranet development, partly due to the concentration on the role of the school librarian and also because they are a relatively recent phenomenon in Scottish schools. It would be useful to re-address the question of intranet roles and responsibilities once intranets have become more established within schools. An in-depth study of a smaller number of schools, involving a greater number of actors is suggested. There is potential for action research to investigate whether more directive senior management support or other strategies would aid intranet development. It was suggested as in School 5 that schools could go on to identify further uses for their intranets. It would be particularly interesting to study a school which moves to use their administrative data and identify whether there is a need for activators to appear in that area.

School 15 was making progress in the area of homework support, firstly using the intranet but also planning to use the website. This is clearly an area which is of much interest to many schools. The role of the school librarian was equally interesting in that through the recent "Issues" site he was clearly extending his educational input. There is potential for a study with a stronger focus on the information literacy support offered by school librarians. This is one area of their work which clearly needs to be promoted within Scottish education.

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1 Questionnaire sent to local authorities

Maureen Carter: Queen Margaret University College

Intranets in Scottish Secondary Schools

	Access to intranets.
1	Do secondary schools have access to an authority intranet? If not, are there plans for secondary schools to have access to an authority intranet?
2	Do all secondary schools in your authority have their own intranets? If not, are there plans to provide secondary schools with their own intranets?

Only answer question 3 if you answered No to All the above questions. If you answered Yes to any of the above questions, go to question 4.

	No intranets
3a	What is the authority providing in terms of the National Grid for Learning?
	Network access <input type="checkbox"/> Email access <input type="checkbox"/> Internet connection <input type="checkbox"/> Other <input type="checkbox"/>
	If 'other' please expand.
3b	Why has the authority not considered / decided against intranets?
	Finance <input type="checkbox"/> No educational need <input type="checkbox"/> Other <input type="checkbox"/>
	If 'other' please expand.
3c	Are you aware of any secondary schools in the authority which have an intranet or are planning to develop an intranet?
	Yes <input type="checkbox"/> No <input type="checkbox"/>
	If yes please name.
	Please go to question 15.

	Stage of development
	At what stage of development are you at now with intranet plans in secondary schools? (e.g. Planning / piloting / implementing / integrating / evaluating). Include a completion date.
4a	Authority intranet to which schools have access:
4b	Schools with own intranet:

	Use of the intranet								
5	What is the purpose of the intranet? Tick as appropriate. <table border="0"> <tr> <td>Type of intranet</td> <td>Administrative E.g. pupil records</td> <td>Curricular E.g. learning resources</td> <td>Other</td> </tr> </table>	Type of intranet	Administrative E.g. pupil records	Curricular E.g. learning resources	Other				
Type of intranet	Administrative E.g. pupil records	Curricular E.g. learning resources	Other						
	<table border="0"> <tr> <td>Authority intranet</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>School intranet</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table> <p>If 'other' please specify</p>	Authority intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	School intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Authority intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
School intranet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						
6a	What types of information are available on the authority intranet? Please specify or send relevant documentation.								
6b	What types of information are available on the school intranet? Please specify or send relevant documentation.								

	Home Use	Yes	No	Under consideration
7a	Is the authority intranet accessible from pupils' homes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7b	Is the school intranet accessible from pupils' homes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Planning		Yes	No
8	Prior to either authority or school intranet implementation was a technology survey carried out in secondary schools?	<input type="checkbox"/>	<input type="checkbox"/>
If yes please give details of what this included.			
9a	Prior to either authority or school intranet implementation was a user needs survey carried out in secondary schools?	<input type="checkbox"/>	<input type="checkbox"/>
If yes please give details of what this included.			
9b	Have the school library service or individual school librarians been involved to any extent in the user needs survey for intranets?		

Training		Yes	No
10	Has the authority provided any training in relation to intranets?	<input type="checkbox"/>	<input type="checkbox"/>
If yes please specify or enclose relevant documentation.			

Policy / Guidelines		Yes	No	Planned
11a	Authority Intranet. Has the authority developed any policy documents or guidelines for schools on how this intranet should be used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11b	School Intranet. Has the authority developed any policy documents or guidelines for schools on how this intranet should be used?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If yes for either question, please enclose relevant documentation.				

	Management of the intranet	Yes	No
12	How is the school intranet managed within each secondary school?		
	Full-time network manager in each secondary school.	<input type="checkbox"/>	<input type="checkbox"/>
	ICT co-ordinator with teaching commitment.	<input type="checkbox"/>	<input type="checkbox"/>
	Network manager at Authority level	<input type="checkbox"/>	<input type="checkbox"/>
	Other Please specify-		

	Technical support	Yes	No
13a	What technical assistance is available to each secondary school?		
	ICT technician: full-time in each secondary	<input type="checkbox"/>	<input type="checkbox"/>
	ICT technician: part-time in each secondary	<input type="checkbox"/>	<input type="checkbox"/>
	Central technician support service	<input type="checkbox"/>	<input type="checkbox"/>
	Managed Service Provider	<input type="checkbox"/>	<input type="checkbox"/>
	Other. Please provide details-		
13b	Is the authority happy that technical support is sufficient to meet school needs or is this an area for concern? Please provide details.		

	Evaluation	Yes	No	Planned
14	Is there a review system in place for evaluating intranet use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	If Yes please enclose any relevant documentation			

	Please provide the following details.	
15	Name of Education Authority	
	Job title of person completing questionnaire	
	Telephone number	
	Email address	

Thank you for your cooperation.
Please return ASAP

Email: mcarter@qmuc.ac.uk

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2 Intranet – Model

CONTENT OF SCHOOL INTRANET

Please tick where in use on school intranet. Mark with P if planned for future use.

ADMIN/MANAGEMENT		RESOURCES		COMMUNICATION	
Finance		Internet connection		Email	
Timetables		On-Line subscriptions eg Reuters		Bulletin Boards- Discussion forums eg Club news	
School Registers		CD-ROM-networked eg Encyclopedias		Video Conferencing	
Exam Information		Curriculum related websites-downloaded		Technology Support- eg FAQ How to search www: how to develop instructional pages: etc	
R.O.A		Instructional websites ie interactive lessons developed by teachers		Staff Information eg daily news	
Staff Records		Library Catalogue May include departmental Collections		Community Information eg Former pupils Newsletters School events	
Internal Publications Non-public info. Eg Minutes Calendars Staff phone book		Departmental Subject Information		Parent Information- eg enrol. procedures handbooks, newsletters	
		Career Resources		Student Work on Display	
Other-		Internal Publications/ Public Information eg School Dev Plans Working Party reports Policy Documents		Pupil information- eg- code of conduct Daily news Catering information	
		Pupil Homework Pages eg test/revision sheets Hints on studying			

List data from Authority intranet used within the school

3 Year 1. Information gathering

With the lack of published literature on school intranets it was considered important to make contact with school librarians and to carry out background visits to schools to ensure that the question topics in the formal research section were thoroughly grounded.

3.1 Discussions on list serves

A request for school librarians with intranets to contact the researcher was sent to LM-NET (USA) and OZTL-NET (Australia) discussion lists in February 1999. The request produced only two responses from LM-NET, one from an International School in Belgium and one from a librarian in the USA. The contacts were asked about their involvement with their school intranets. The following are the main points taken from the responses:

LM-NET

American view- The main value of the intranet is communication, email, saving time and paper.

Belgian comments- The OPAC has extended the library to every networked computer. The benefits are saving time for staff coming to the library, whilst students are able to publish. It completes the research cycle. The librarian described his role as architect, designer, builder of online information. He streamlined the way students get information. He selected Internet content and created age appropriate information.

Comment: This provided early evidence that librarians may use the intranet to different extents. The second librarian confirmed that school librarians may be involved in more technical roles, designing the space and access to resources. The role is one of an intermediary and is implicitly linked to his role as information skills provider. This agreed with the potential of what was suggested in the literature review.

OZTL-NET

Thirteen responses were received from New Zealand and Australia. The responses were analysed manually and the main tasks undertaken listed and grouped as follows:

Tasks	Roles
Participating in planning groups	Management role
Organising files to make them easily accessible	Technical & information man role
Directing people to information	Resourcing role
Creating web based pages	Technical & resourcing role
Updating content	Technical & resourcing role
Troubleshooting library technology	Technical role
Training staff	Instructional role
Encouraging staff to use electronic submissions	Promotional role in relation to technology

Table 17 OZTL-NET responses. Tasks and roles

Magazines/journals online (e.g. Ebsco Host)	CD ROMs
Downloaded electronic files requested by teachers	Catalogue
General Library Information	Handbooks/Daily information
Subject Links	Instructional files
Book reviews	

Table 18 OZTL-NET responses. Intranet content.

Benefits

- It brings staff cohesion as the library becomes more central to the teaching and learning process
- Improved communication
- There is less need for staff to come physically to the library
- There is changed perception of the library

Problems

- Teaching staff are not using the intranet much
- Staff have not got time to get to grips with constructing pages
- There is a lack of professional development and training. There is pressure for librarians to keep up-to-date
- Librarians are not involved in planning
- One librarian complained of "booking" in classes for ICT which she felt was not her role
- There is concern when technology is seen in terms of networks rather than skills and resources. Librarians emphasised information skills including a crusade against cutting and pasting.
- There is a need for extra student supervision. There are complaints of student access to undesirable sites which adds to the workload for school librarians.
- Technology problems. These include complaints of access, slow networks, licenses, CD installation which can make librarians more dependent on others ie technical support.

Comments

Two librarians talked in terms of being proactive. The intranet has meant that they were spending time looking for information in advance, sending it out to teachers rather than waiting for them to come with requests to the library. One librarian commented that the intranet had changed her role considerably as the focus has become "much more curriculum related." She now worked closely with various teachers to locate information and to develop curriculum files which support class work. She has always done this to some extent "but the intranet has forced teachers to consult with us in a way that they could avoid before."

Another comment was that the "intranet is very much a work in progress which is how it should be" (an evolutionary intranet). One librarian had had a specific job title change which he implied went with the changes in the intranet as he had now become "Information skills support."

Although two of these thirteen school librarians talked in terms of intranet involvement being "exciting" not everyone appeared as enthusiastic. This can be seen through the list of problems raised.

3.2 Contact with UK Journals

A letter was sent to the Library Association Record (LAR) and School Librarian Journal in June 1999 asking for librarians in schools with intranets to contact the researcher. Two librarians from English schools entered into a series of discussions. The tasks and roles undertaken were identified as follows:

Tasks	Roles
Scanning Internet	Resourcing role
Emailing staff	Resourcing role
Booking computer suite for teaching staff	Library management role
Uses intranet to outline information skills programme	Instructional role

Table 19. LAR responses. School 1 tasks and roles

Tasks	Role
Updating – Library and staff pages	Resourcing & technical role
Linking – useful websites; staff current awareness	Resourcing
Alerting- staff LRC resources and information	Resourcing
Providing – sub-topic trails	Resourcing
Creating instructional websites	Resourcing, instructional & technical role
Technology support for the library technology	Technical role
Hopes to include the OPAC and photographic virtual tool	Promoting role.

Table 20. LAR responses. School 2 tasks and roles

Comments;

Librarian 1 felt that the intranet had not changed her role but had made staff aware of the possibilities of the medium in a controlled environment. Librarian 2 talked of the intranet being both “exciting” and “threatening.” Asked for the reason behind her involvement in the intranet she responded “I was interested.” She felt that it is very much up to the librarian to influence developments (individual characteristics).

In comparing the UK school librarians to the international librarians it can be seen that there are many similarities in the tasks identified. But no mention was made in the UK of training staff, nor of involvement in planning decisions.

It was clear from comments from OZTL-NET school librarians that many of them had more in the way of support (e.g. other qualified library staff or clerical assistance) than might be expected in Scottish secondary schools.

3.3 Informal visits to schools

Informal interviews were carried out in Scottish schools. These took place between January to May 1999. There was no formal interview structure to these. Only one interview was held in each of the five schools, three with school librarians, one with an assistant head teacher and one with an ICT coordinator.

School 1- School librarian interview.

This school has initiated their own intranet development. The librarian also appeared to have a role in encouraging others in the school, both staff and pupils to use the intranet and in particular to develop skills in using the intranet. For example he had helped a Geography teacher who was interested in providing an instructional website on volcanoes. The help was in the form of encouragement to the teacher, of searching the Internet for suitable websites and in using his pupil helpers to do the technical part of putting the site together.

A number of potential factors to the schools intranet development were identified.

- Parental influence (Providing finance and technical support).
- Interest of senior management
- Presence of motivated senior pupils (who were starting the process of creating content for the intranet)
- The enthusiasm of the school librarian.

School 2 – Assistant head teacher interview.

The school was partially networked and intended to install their own intranet. Intranet plans had come to a halt due to lack of finance. The school had a history of involvement in ICT Projects. To keep the initiative in ICT they aimed to apply to various sources for further funding. The librarian lacked ICT skills but was due to retire soon. The school was keen to develop the library as an ICT centre and with this in mind talked of appointing someone “younger” with suitable skills. They would also like a network manager but considered it unlikely to happen at that time.

Positive factors in the development to date:

- The assistant head’s personal “crusade” and belief
- The support of the head teacher to find funding
- Motivation in the school to be ahead in ICT and become involved as a school in a variety of ICT related projects.

Apparent negative factors

- The lack of funding to purchase another server.
- The limited ICT skills of the school librarian.
- The need for a Network manager

School 3– School librarian interview.

The authority intranet was being installed at the time. This school had been seen as an ICT leader but their own plans for intranet development had come to a halt as the authority has introduced their authority intranet. The librarian felt that that the school had suffered a loss of motivation and interest as control had been taken from them.

The librarian was very unwilling to answer technical questions. The library had a great deal of technology and the librarian appeared confident in managing this. She had difficulty in keeping abreast of technical problems in the library due to different systems and the age of the computers. She was involved in the ICT working party but they had no policies at that time and were at a standstill with their own intranet developments. The librarian had received no support from the school library services on intranets. The librarian worked closely with teachers and talked of bookmarking Internet sites in advance of class visits. She also discussed her concern over cutting and pasting. She felt that the intranet should raise the profile of the library and motivate pupils. But she saw no specific role for her in relation to the intranet development.

School 4 – School librarian interview. This school had access to an authority intranet. The school was also developing their own in-school intranet. This library had recently received 12 new computers in a mini-suite which could be booked through the librarian. Although the librarian was around, she did not anticipate having a major involvement in supervising or helping with use. Few staff in the school had received training. The librarian had been on a course for CLARIS homepage. She had yet to develop any pages herself. She had ideas of what she would like to do on the intranet such as a review site, catalogue, subject links. Despite training and presence of a full-time library assistant this librarian had yet to make time for any development in connection with the intranet. Although she had access to the authority intranet, the librarian made infrequent use of it, but was able to demonstrate it to the researcher. There appeared to be a lack of information concerning the intranet coming from headquarters.

School 5 –ICT coordinator interview. This school had access to an authority intranet. The school had no plans for their own intranet. This interview focused solely on the development of intranet question. To develop their own intranet the school will have to find around £4000 to purchase file-sharing print services. The ICT coordinator was sceptical of use of an in-school intranet as there were no current facilities in the school for class use (outside Computing, Business Studies and Technical). The library was too small. The ICT coordinator was responsible for in-school training of staff. He had limited time for this. The school should be getting a part-time technician but the ICT coordinator doubted whether this would be sufficient to meet their needs.

This interview although very negative, highlighted a number of practical issues which may hinder development of intranets, such as finance and access to computers, technical assistance and training. It also indicated that lack of enthusiasm and attitude may be significant in pushing for an intranet.

Comment

These visits included schools which were planning intranets and one which only had access to an authority intranet. The negative features highlighted in these schools helped to provide areas for investigation. It confirmed the decision to look at a range of schools where comparisons can be made between what is happening in active schools and the less active. In the two Scottish schools which were positive about intranets, it is noticeable that they included enthusiastic individuals. Other key features were finance and schools as ICT leaders. Only one of the Scottish schools had a librarian involved in the technical side of the intranet but this role was limited to creating content with no involvement in managing the intranet. But he did appear to have some involvement in staff training.

3.4 Informal visit to educational headquarters

Visits were paid to three Scottish education authorities between March and June 1999. Interviews were held with one individual involved in developing the intranet in each of the authorities. The authorities were not selected on any methodological basis but came from suggestions from the school visits. The interviews were semi-structured, building on the information which had already been gathered.

It appeared that the three authorities were concentrating on the technological infrastructure rather than content. At this stage there was little evidence of how the intranets were to be used and those interviewed talked of solving technology problems. There appeared to be lack of training, lack of policies and lack of technical support. It did seem to suggest that much would be dependent on crucial roles – such as the head teacher and ICT coordinator. Their involvement would need greater investigation. One of the authorities intended far greater administrative use than the early interviews in schools had suggested. At this stage there was little evidence of need for change to information skills, learning and teaching, suggesting this would be up to schools. There was little said on the involvement of school librarians. It was decided that future authority interviews should include school library services.

3.5 The Scottish Interactive Technology Centre

The SITC at Moray House had been involved in creating on-line support systems for teaching and learning. The SITC were able to demonstrate a “framework” which could be used by schools and developed for their own intranet. This had initially been used as part of a project for primary science. The main features were a “prep” room for the sharing of teacher worksheet materials, a “forum” where pupils could pose questions, a library where there were links to other sites and useful documents and a café where teachers could email helpers or experts who had previously agreed to act as helpers. The SITC site had faced difficulties promoting the framework as many schools still did not have a fully networked environment. There had also been problems with using the intranet (eg in the teachers forum not all questions were suitably framed, in the pupils section, pupils work was often unsuitable for scanning). The visit had been useful in identifying that even when purchasing an “off the shelf” intranet package, schools may need to spend considerable effort to make full use of these. Content may need adapting and support to teachers necessary.

3.6 Phone calls to Scottish education authorities

The phone calls were carried out in an attempt to identify authorities where there would be possible schools for participation in the research. Information on time scales was necessary. These phone calls were made in March 1999. Not everyone was keen to give out information over the phone. It became clear that many authorities were currently making decisions concerning networks and intranets. It highlighted that there could be a great difference in what schools were provided with as some authorities were planning giving schools their own intranets immediately whilst others were focussing on authority intranets. There was insufficient data to identify enough authorities to approach for finding schools. A decision was made to send questionnaires in January 2000 as part of the formal research process.

3.7 Conclusion

From these initial contacts topics in the semi-structured interview schedules were developed. One outcome of these early interviews was the need to put contextual questions to the appropriate individual. Hence the more technical questions relating to the intranet should be put to ICT coordinators alone.

4 Schedule of topics sent to interviewees at Authority level

This was the key topics sent to each in advance. Each interviewee was asked specific questions which followed from authority data provided in the questionnaire.

Interviews with the heads of the School Library Service.

Topics to be covered:-

Involvement of school librarians in planning stage for intranets in your authority.

Role of school librarians within intranet environment.

Skills specific to that role.

Strategies available to support the school librarian.

Concerns in relation to introduction of intranets.

In-service training and future education of school librarians

Interviews with Intranet Development Officers

Topics to be covered:-

Stage of intranet development

Purpose of the intranet

Content of the authority intranet

Content of schools intranet

Planning

Strategies for developing the intranets in schools

Role of school librarian

- skills required

5 Schedule of topics sent to schools

5.1 Head Teacher Interview

This is a semi-structured interview. I have identified areas which I think are important for discussion. However during the course of the interview other areas of interest may be followed up.

Intranet characteristics

- Purpose of your intranet
- Actual use of intranet
- Effect of intranet

Local Authority characteristics

- Support given

School characteristics

- Interest in ICT related innovation
- Integrated into teaching and learning?
- Issue of information skills
- Community/parent involvement/home use

Characteristics of key people

- Head teacher's role in intranet development
- Senior management support
- Role of ICT co-ordinator/ Network Manager/Teacher responsible for ICT
- Role of librarian- skills required in future education

External characteristics

- Impetus for intranet from external factors

Strategies for innovation in-school

- Working party
- Policy/dev plans
- ICT training in school
- Technician support in school
- Other

Future

- Main benefits
- Main problems identified by senior management

5.2 ICT co-ordinator/ Network Manager Interview/Teacher responsible for ICT

This is a semi-structured interview. I have identified areas which I think are important for discussion. However during the course of the interview other areas of interest may be followed up.

Role of ICT co-ordinator /network manager/teacher responsible for ICT(characteristics of key person)

- Role
- Training support for role

Intranet in Context

- Introduction of intranet into school
- Roles

Intranet characteristics

- Purpose of your intranet
- Actual use of intranet
- Effect of intranet

Local Authority characteristics

- Support in terms of -
 - Training
 - Finance
 - Technical support
 - Working parties / subject specialists / guidelines
 - Other

School level characteristics

- Interest in ICT related innovation
- Integrated into teaching and learning?
- Issue of pupils' information skills
- Community/parent involvement/home use

Characteristics of key people

- Senior management support
- Role of librarian- skills required in future education

External characteristics

- Impetus for intranet from external factors

Strategies for innovation –in school

- Working party in school
- Policy/Dev plans
- ICT training in school
- Technician support in school

Future

- Main benefits of an intranet
- Main problems identified by you in introduction of intranet

5.3 School Librarian Interview

This is a semi-structured interview. I have identified areas which I think are important for discussion. However during the course of the interview other areas of interest may be followed up.

School Librarian characteristics

- Background
- Qualifications
- Professional development

The Library in context

- Your role
- Present use of the library
- ICT in the library

Intranet characteristics

- Purpose of your intranet
- Actual use of intranet in school
- Library resources on the intranet- Plans

Local Authority characteristics

Support in terms of -	Training
	Finance
	Technical support
	Working parties /subject specialists /guidelines
	Other

School level characteristics

- Interest in ICT related innovation
- Integrated into teaching and learning?
- Issue of pupils' information skills
- Community /parent involvement /home use

Characteristics of key people

- Librarian involvement in intranet
- Future role of librarian?- skills required
- Senior management support
- Role of ICT co-ordinator/ Network Manager/Teacher responsible for ICT

External characteristics

- Impetus for intranet from external factors

Strategies for innovation

- Working party in school
- Policy/Dev plans
- ICT training in school
- Technician support in school
- Evaluation of intranet

Future

- Main benefits of the intranet
- Main problems

6 Subject Information Sheet

Researcher: Maureen Carter
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Department of Information Management
Corstorphine
Edinburgh EH12 8TS
Email: mcarter@qmuc.ac.uk
Tel: 0131 317 3513

Investigation of intranet development in Scottish secondary schools and the role of the school librarian.

Methods- An overview.

(i) January 2000 - **Questionnaires to all 32 Scottish education authorities.**

Purpose:- assess what authorities are providing in terms of intranets; timescales involved; strategies for support to schools.

(ii) March/June 2000- **Three studies of education authorities.**

Purpose:- in depth analysis into the support available to schools and reasons behind decisions affecting intranets.

(iii) September 2000- June 2001- **Interviews with the head teacher (or member of senior management team), ICT co-ordinator and school librarian in up to 15 secondary schools across Scotland.**

Purpose: - to identify how intranets are used in schools,
to identify factors involved in intranet development,
to understand the role of the school librarian within an intranet environment.

Outcomes

- 1 Development of an indicative model of a school intranet.
- 2 Identification of the critical roles of the school librarian.
- 3 Recommendations for the education and in-service training of school librarians within an intranet environment.

Completion date for PhD – January 2002.

All interviews will be taped, unless otherwise requested.

All tapes will be destroyed at the end of the research.

All interviews will be treated as confidential.

No individual or institution will be identified in the research or in any publications which come from it.

Before the start of the interview you will be given the chance to ask questions regarding the research.

7 Contact summary form

Name :	Role :
Site :	Authority :
Email :	Today's date :

What were the main issues or themes that struck you in this context?

Summarise the information you got (or failed to get) on each of the target questions.

Intranet use

Authority characteristics

School characteristics

In-school strategies

Key people

Librarian's role

Are there any omissions in considering this interview (issues not raised)?

Action- required. On reflection does any aspect of the interview require clarification?

8 Letter accompanying questionnaire

This letter was sent to the person in charge of intranet development in each Scottish education authority.

11th January 2000.

Dear Mr X,

In November 1999 I wrote to the Director of Education for your authority requesting permission to send out a questionnaire to the ICT development officer for the authority. I was granted permission and given your name as the appropriate person to send it to.

I am currently undertaking a PhD at Queen Margaret University College, Edinburgh on factors affecting the development of intranets and the role of the school librarian within Scottish Secondary Schools. As part of this research I am investigating the support given by local authorities to secondary schools in developing intranets. I have produced a questionnaire which is being sent to all 32 Scottish education authorities. It is very important to me that I have a response from every authority. Later research will involve interviews in schools where there are intranets in place and will concentrate more specifically on the role of the school librarian.

I would appreciate it if you could complete the questionnaire and return it by **31st January**. Please answer the questions as they apply to your authority.

The definition I would apply to an intranet is

“an organization’s internal communication system using Internet technology”

And for a network

“a group of computers linked to share the same data and other resources”.

Where possible I have requested supplementary material if this is available.

No authority, school or individual will be identified in this research or in any publications which follows it. Please feel free to contact me if you have any queries.

Thank you very much for your help,

Yours sincerely,

Maureen Carter
mcarter@qmuc.ac.uk
Department of Information Management
Queen Margaret University College
Edinburgh EH12 8TS

9 Letter sent to interviewees at Authority level

Department of Information
Management
Queen Margaret University College
Corstorphine,
Edinburgh EH12 8TS
4th March 2000

Dear

I am currently undertaking research at Queen Margaret University College on intranets and the role of the school librarian in Scottish secondary schools. I am at the second stage in my research, which involves interviews with Intranet Development Officers and the Head of School Library Services in three selected Scottish Authorities. I am writing to request an interview with you in your role as having responsibility for school library services in *Authority B*. I have enclosed a Subject Information Sheet which provides more details of my research.

The interview should last no more than 40 minutes. Enclosed is a brief outline of the topics I intend to cover. I would be happy to arrange a time convenient to you, between now and the start of July.

I hope you will consider my request. There are few in-depth studies on the role of the school librarian and with the new demands of intranets there is an ever increasing need to take a closer look at this role.

I look forward to hearing from you,
Your sincerely,

Maureen Carter

10 Letter requesting participation in schools

Example of letter sent to each school requesting participation.

Department of Information Management
Queen Margaret University College
Corstorphine
Edinburgh EH12 8TS
12th February 2001.

Dear Mr X

I am a PhD research student at Queen Margaret University College, Edinburgh. I am investigating **factors affecting the development of intranets in Scottish secondary schools and the impact on the role of the school librarian.**

I am writing to ask you to consider taking part in my research. The research aims to identify how intranets are being developed and used in schools, to examine the actual role of the librarian in an intranet environment and to assess implications for the future education of librarians. This is the third and crucial part of my research which will involve interviews in up to 16 schools from across Scotland.

For these interviews there are two basic criteria, which I believe your school meets. These are that the school has:-

1. access to an intranet- either the Authority intranet or your own intranet for at least 6 months and
2. a qualified school librarian.

What the research involves is interviews with three key staff - the **head-teacher (or member of senior management)**, the **ICT co-ordinator** and the **school librarian**. Each interview should last no more than 45 minutes. I would hope that the interviews can be arranged between **now and the end of May 2001**. No individuals or schools will be identified in the research. If you feel you meet the above criteria and the appropriate staff are interested in taking part in the research I would be delighted to hear from you.

I realise that research is a low priority for schools and that this will take up valuable school time. However I do believe that there is much to be learnt which is important both to the future of school librarianship in Scotland and to the growing development of intranets.

If you wish more information please contact me by email at mcarter@qmuc.ac.uk or telephone 0131 317 3513.

If you do agree to take part I will send further information on the research and on the topics to be discussed.

I look forward to hearing from you,

Yours sincerely,

Maureen Carter

11 Questionnaire: The findings

28 Responses received from 32 Authorities - 27 complete, 1 partially completed.

	Access to intranets.
1a	Do secondary schools have access to an authority intranet? Yes- 13 No- 15
1b	If no, are their plans for secondary schools to have access to an authority intranet? Yes- 15 No- 0
2a	Do all secondary schools in your authority have their own intranets? Yes- 5 No- 23
2b	If no, are there plans to provide secondary schools with their own intranets? Yes- 13 No- 2 Possibly- 4 Decision left to individual schools- 4

	No intranets
3	This section was to be completed only if there were no plans for an Authority intranet or schools own intranets. No Authority fell into this category.

	Stage of development				
4	<p>At what stage of development are you at now with intranet plans in secondary schools? (eg Planning / piloting / implementing / integrating / evaluating) Please include a completion date for the implementation of intranets.</p> <table> <tr> <td> <p>Authority intranet n= 28</p> <p>Discussion -1 Planning -9 Piloting -3 Implementing- 9 Integrating -1 Evaluating -2 Completed -2 Different stages in different schools – 1</p> </td><td> <p>Completion Dates n=28</p> <p>Complete- 5 Unable to give a date - 11 March 2000- 2 April 2000 - 1 June 2000 -1 August 2000- 6 December 2000-1 December 2002- 1</p> </td></tr> <tr> <td> <p>School intranet n=23</p> <p>Discussion -1 Planning -6 Piloting -4 Implementing – 4 Evaluating – 1 Complete – 1 Different stages in different schools –2 Devolved to each school- 2 Answer unclear -2</p> </td><td> <p>Completion Dates n=19</p> <p>Complete –2 June 2000 –1 August 2000 – 3 December 2000 –3 August 2001 – 1 N/A –9</p> </td></tr> </table>	<p>Authority intranet n= 28</p> <p>Discussion -1 Planning -9 Piloting -3 Implementing- 9 Integrating -1 Evaluating -2 Completed -2 Different stages in different schools – 1</p>	<p>Completion Dates n=28</p> <p>Complete- 5 Unable to give a date - 11 March 2000- 2 April 2000 - 1 June 2000 -1 August 2000- 6 December 2000-1 December 2002- 1</p>	<p>School intranet n=23</p> <p>Discussion -1 Planning -6 Piloting -4 Implementing – 4 Evaluating – 1 Complete – 1 Different stages in different schools –2 Devolved to each school- 2 Answer unclear -2</p>	<p>Completion Dates n=19</p> <p>Complete –2 June 2000 –1 August 2000 – 3 December 2000 –3 August 2001 – 1 N/A –9</p>
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	Use of the intranet
5	What is the purpose of the intranet?
	<p>Authority intranet 21 - both Administrative and curricular 1 - Administrative only 4 - Curricular only 1 - N/A 1 – links to Council depts and approved web sites</p> <p>Among “other” responses- Corporate information (3) Learning communities (1) Communication (2) Conferencing (2)</p>
	<p>School intranet 12 - Administrative and curricular 0 - Administrative only 8 - Curricular only 8 - Did not answer</p> <p>Among “other” responses – Conferencing (1) Communication (1) Leisure clubs (1) Display information on schools (2)</p>

Content of the intranet																																																																																					
6a	What types of information are available on the authority intranet?																																																																																				
6b	What types of information are available on the school intranet?																																																																																				
	<table><tr><th>authority_A</th><th>Frequency</th><th>schools_A</th><th>Frequency</th></tr><tr><td>Not available</td><td>8</td><td>Not available</td><td>12</td></tr><tr><td>links to curricular sites</td><td>7</td><td>school prospectus/handbook</td><td>5</td></tr><tr><td>discussion/bulletin boards</td><td>7</td><td>software- eg licenced encylopedias</td><td>5</td></tr><tr><td>memos/circulars/ forms</td><td>6</td><td>curricular info-www links</td><td>5</td></tr><tr><td>Policies</td><td>6</td><td>bulletin boards</td><td>4</td></tr><tr><td>staff dev mats/training</td><td>5</td><td>varies from school to school</td><td>3</td></tr><tr><td>info on council depts</td><td>3</td><td>staff folders of work</td><td>3</td></tr><tr><td>schools web sites</td><td>2</td><td>pupil folders of work</td><td>2</td></tr><tr><td>software downloads</td><td>2</td><td>Policy docs</td><td>1</td></tr><tr><td>job vacancies</td><td>2</td><td>school events</td><td>1</td></tr><tr><td>finance</td><td>2</td><td>PTA news</td><td>1</td></tr><tr><td>personnel data</td><td>2</td><td>staff manuals</td><td>1</td></tr><tr><td>best practice</td><td>1</td><td>class information</td><td>1</td></tr><tr><td>prices/supply information</td><td>1</td><td>timetabling</td><td>1</td></tr><tr><td>reviews</td><td>1</td><td>careers information</td><td>1</td></tr><tr><td>research</td><td>1</td><td>local information</td><td>1</td></tr><tr><td>safety files</td><td>1</td><td>courses</td><td>1</td></tr><tr><td>committee reports</td><td>1</td><td>conferences</td><td>1</td></tr><tr><td>MIS software</td><td>1</td><td>catering arrangements</td><td>1</td></tr><tr><td></td><td></td><td>Library catalogue</td><td>1</td></tr></table>	authority_A	Frequency	schools_A	Frequency	Not available	8	Not available	12	links to curricular sites	7	school prospectus/handbook	5	discussion/bulletin boards	7	software- eg licenced encylopedias	5	memos/circulars/ forms	6	curricular info-www links	5	Policies	6	bulletin boards	4	staff dev mats/training	5	varies from school to school	3	info on council depts	3	staff folders of work	3	schools web sites	2	pupil folders of work	2	software downloads	2	Policy docs	1	job vacancies	2	school events	1	finance	2	PTA news	1	personnel data	2	staff manuals	1	best practice	1	class information	1	prices/supply information	1	timetabling	1	reviews	1	careers information	1	research	1	local information	1	safety files	1	courses	1	committee reports	1	conferences	1	MIS software	1	catering arrangements	1			Library catalogue	1
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personnel data	2	staff manuals	1																																																																																		
best practice	1	class information	1																																																																																		
prices/supply information	1	timetabling	1																																																																																		
reviews	1	careers information	1																																																																																		
research	1	local information	1																																																																																		
safety files	1	courses	1																																																																																		
committee reports	1	conferences	1																																																																																		
MIS software	1	catering arrangements	1																																																																																		
		Library catalogue	1																																																																																		

	Home Use	Yes	No	Under consideration
7a	Is the authority intranet accessible from pupils' homes?	0	11	16
	Will be when complete -1			
7b	Is the school intranet accessible from pupils' homes?	2	8	16
	Will be when complete -1			
	Unanswered - 1			

	Planning	Yes	No	N/A
8	Prior to either authority or school intranet implementation was a technology survey carried out in secondary schools?	25	3	0
	<p>If yes please give details of what this included.</p> <p>Where details were given</p> <p>19- hardware audit.</p> <p>14 -cabling/data points/connections</p> <p>8 - software/curricular content</p> <p>2 - assessing accommodation for ICT</p>			
9a	Prior to either authority or school intranet implementation was a user needs survey carried out in secondary schools?	8	18	2
	<p>Six authorities included information on what this included. These were:</p> <ol style="list-style-type: none"> 1- 4 pilot schools carried out specific surveys on the use of ICT in the classroom and the knowledge of their staff. 2- Skills analysis, curriculum review, aspirational analysis 3- Development committee established to ensure that needs of schools was conveyed to the Local Authority. All schools visited and issues discussed with them. 4- Based on demands of the curriculum through interviews with HT's and ICT co-ordinators. 5- Focused around Higher Still demands 6- Pilot schools chosen and evaluated. 			
9b	<p>Has the school library service/school libraries been involved to any extent in the user needs survey for intranets?</p> <p>Yes- 11 No- 11 Answer N/A- 6</p> <p>Four of the no answers indicated " not yet."</p> <p>Yes answers ranged from</p> <p>Library ICT group provided input from their perspective</p> <p>School librarian on intranet Group- in the pilot this is at the core of the schools ICT facilities</p> <p>Consultation/communication</p>			

	Training	Yes	No
10	Has the authority provided any training in relation to intranets?	15	13
	<p>If yes please specify or enclose relevant documentation.</p> <p>From company supplying the intranet software- 2</p> <p>Front page/ Publisher – 3 (two of these stated for central HQ staff only)</p> <p>Internet skills- 4</p> <p>Email- 3</p>		

	Policy / Guidelines	Yes	No	Planned
11a	Authority Intranet. Has the authority developed any policy documents or guidelines for schools on how this intranet should be used?	8	4	15
11b	School Intranet. Has the authority developed any policy documents or guidelines for schools on how this intranet should be used?	3	7	15

	Management of the intranet	
12	How is the school intranet managed within each secondary school?	
	Full-time network manager in each secondary school.	0
	ICT co-ordinator with teaching commitment.	14
	Network manager at Authority level	14
	<p>Eight had both ICT co-ordinator and network manager at Authority level. PFI- managed services- 6 Schools Intranet Group –1 One Authority stated that the majority of schools seemed to involve senior pupils in maintenance. One- 0.2FTE allocated to each secondary school for professional management issues. Under discussion- 7</p>	

	Technical support	
13a	What technical assistance is available to each secondary school?	
	ICT technician: full-time in each secondary	2
	ICT technician: full-time in some secondary schools	2
	ICT technician: part-time in each secondary	4
	ICT technician :part-time in some secondary schools	2
	Central technician support service (11 of these had no other form of technical support)	20
	Managed service provider	7
	<p>Other 1- school technicians have ICT in their remit 1- ICT officer supports a school “cluster” secondary, primary, special</p>	
13b	<p>Is the authority happy that technical support is sufficient to meet school needs or is this an area for concern?</p> <p>Five authorities considered that they provided adequate technical support. Eight authorities stated that technical support is under review. Six authorities clearly indicated that technical support was not yet sufficient. (see discussion for more details)</p>	

	Evaluation	Yes	No	Planned
14	Is there a review system in place for evaluating intranet use?	1	8	17

12 ICT co-ordinator role

School 5 had no ICT co-ordinator as such but a member of senior management with ICT in his remit, and the school librarian as intranet editor. In School 2 a senior manager was responsible for ICT, with no ICT co-ordinator. There was a senior teacher for ICT (Physics) who was responsible for creating the first intranet before the school librarian re-built it and took over the management. The deputy head emphasised the senior teacher's role in teaching and learning and in speaking to staff about use. The senior teacher no longer worked on the content for the intranet but managed hardware, software and staff training. He had a mere one hour per week and admitted to spending much more than that on the job stating "it is unsustainable."

A number of schools have appointed a member of senior management as their ICT co-ordinator (3,4,8,10,14). In none of these was there anyone specifically in charge of the intranet. ICT co-ordinator 10 stated of ICT generally "I have got to say in terms of computer use it certainly has gone beyond my expertise." In his opinion there was a need for a full-time person to manage their network system, but not necessarily a technical person as he felt the technical support services could deal with that. The senior management in Schools 3 and 4 dealt with many practical issues on a daily basis. Deputy head 3 was given the role as he was the only member of the senior management who "is vaguely qualified for it" (head teacher 3). As one of his responsibilities there was no time allocation. He was very critical of the authority as he had had little training and stated "if this was a business with two hundred odd computers then they would have had a full-time network manager and at least one technician and yet schools have absolutely nobody at all." It was a similar story in School 4.

In School 8 the assistant head teacher (AHT) felt that the post of ICT co-ordinator needed to be someone in senior management who had an overview of the school. He relied on other teaching staff in the school to see to the more technical tasks.

The other schools generally had a senior manager who had policy responsibility for ICT alongside a teacher as ICT co-ordinator. In School 14 in addition to the AHT as ICT co-ordinator, the former head of Computing was referred to as Network Manager. As such he was given one day per week for the role. The appointment of the technician to create web page materials would allow the Network Manager to focus on "staff development and learning and teaching" (from AHT interview).

In School 11 the principal teacher of Computing was ICT co-ordinator whilst a member of the senior management team had been given specific responsibility for ICT. The head talked of this decision as necessary in terms of driving things on "I think there should be someone at senior management level who has an overview who can go out to the departments and get support from people and bring them on board." The head still felt that there was a need for a full-time network manager and this was reiterated by the ICT co-ordinator who stated "There has to come a point where the ICT co-ordinator is non-teaching to fulfil the terms of the job. It is very, very time consuming." For him this entailed ensuring that the equipment was in working order, arranging for the technician to repair it, co-ordinating how ICT was used within the school, ensuring adequate levels of training (but not necessarily doing the training). Despite the head teacher's enthusiasm the ICT co-ordinator had no immediate plans to start developing content.

In School 13 the ICT co-ordinator role was not given to Computing or a recognisable IT department but to a Drama teacher. The head teacher was quite specific about the benefit of this in that "he is not an IT specialist" because the "ICT Co-ordinator for me is about teaching and learning." This was demonstrated in that he used the technology in many ways in his own teaching (eg pupils analysed their performances on CD ROM). In addition to the classroom experience of using the technology the ICT co-ordinator was described as having great interpersonal skills and patience for encouraging staff. The head teacher differentiated between the technicians role and that of the ICT co-ordinator emphasizing the latter's need to be a teacher but not a technician. ICT co-ordinators 7, 11 and 13 were principal teachers and had technician support for half a week. ICT co-ordinator 13 had one day per week allocated to his role whilst ICT co-ordinator 11 had two and a half days per week. Off-tape ICT co-ordinator 13 commented on the fact that he needed to clarify with staff what his remit was as he was spending too much of his time sorting out technical problems. He saw himself working with teachers on a one to one basis encouraging specific project use rather than whole school development of the intranet. In School 7 the intranet group were coming to the ICT co-ordinator to put the intranet

together and manage the system. He stated "The AHT has proclaimed himself to be the editor and they I presume they will come to him with material. I will tidy it up, re-shift and rebalance the pages. I will make myself a technical person and stitch the site together." All interviewed within School 7 felt there was a need for a fulltime ICT person in addition to the technician role. ICT co-ordinator 7 considered that there should have been a six-month secondment to set up the intranet, create search facilities, databases, and buttons.

In Schools 6, 9 and 12 where there was a Managed Service, the role of the ICT co-ordinator was in policy creation, in-service training and contact person for the Managed Service. ICT co-ordinators 6 (Technical teacher) and 12 (Computing) both saw it as their duty to maintain and develop the intranet. ICT co-ordinator 9 (Business Studies) did not have the skills for managing and developing the intranet.

School 1 alone did not specify a member of senior management in their ICT discussions. The principal teacher of Computing was in charge of the network, supported by the senior teacher in Computing. Their role was in managing the network with a strong emphasis on staff training. The intranet was built and maintained by them.

13 Technical issues

- More time should have been spent planning for the technology.
- Need for detailed technical knowledge in schools eg although the authority had provided the funds for the "curricular network" School 4 had to "design" it themselves.
- Speed of network. School 11 had to purchase a new server at their own cost to improve this.
- Network crashing . Problems when pupils download large files.
- Speed of change of software for creating web pages. Comment that some school websites look out of date very quickly.
- Updating the equipment which goes onto the intranet.
- The number of computing agencies which schools have to deal with. This has issues of time when repairing faults as schools need to know who to contact.

14 Technician support

Only School 8 had the services of a full-time ICT technician. This person was experienced, running their own ICT company. It was indicated that they were lucky to have that quality of person in charge of their system and that they would "fight any suggestion from the authority to share him." Their in-school technician was their first port of call before calling ICL for help.

A number of schools themselves fund a part-time technician. School 14 would like to be in the position to fund more hours for their technician, even preferring a technician to a network manager. Their ICT technician has design skills and will be responsible for creating their web pages. School 1 have had two attempts to hire an ICT technician, both failed. The head teacher talked of issues of pay and market forces, and considered that they would have to train someone up themselves. Three schools have done just this, funding training for their electronics technician on ICT (Schools 2, 3 and 4). Head teacher 3 talked of a "desperate" need for a technician. Head teacher 4 pointed out that although their technician was fully capable of dealing with overhead projectors and videos asking him to take on an NT environment was very difficult. In these three schools none of the Computing teachers were given the title of ICT coordinator. The senior management interviewed appeared to have greater hands on responsibility for ICT (ie doing the Igear training) than found in other areas of Scotland.

Schools 7, 11 and 13 have the presence of an authority technician for a couple of days per week, based in their schools. School 1 had been in a similar position but the authority after testing this system had withdrawn the part-time technicians to headquarter to concentrate on major projects. This has left the school in a difficult position.

Schools 6, 9 and 12 (in Authority B) have no ICT technician based in their school as they have a fully Managed system.

Schools 1, 5 and 10 did not have an in-school technician but relied on authority support, rather than Managed Service Support. Only School 1 was greatly concerned over lack of technical support.

Technical support from the authority

The most common system was to have authority technicians based at central support unit, visiting schools as required to install software or deal with faults (Schools 1, 2, 3, 4, 5, 10). As mentioned School 1 felt the system was grossly inadequate and were looking to employ a technician. Authority E covers a wide geographical area with only two ICT technicians to support all schools. Head teacher 3 stated "We've had to really guern for the support. We've had to complain and demand and whine, so it has really been problematic." Head teacher 4 talked of infrastructure problems which took a year to resolve. School 2 talked of plans to increase the authority technicians. An authority memo viewed in School 4 indicated that 6 new posts were to be created.

Two schools were not quite so dissatisfied with this system (5 and 10). School 5 talked of technicians "popping" in from time to time, or coming straight out if there was an emergency. However technical support specifically for the intranet was always dealt with by ICL. In School 10 the recently created IT Unit visited as necessary. The librarian did state that they benefited from being physically close to the Unit. ICT coordinator 10 described it as an "excellent development." However the head teacher was not so happy and felt that they could not sustain a system of adding ICT responsibility to promoted posts. School 14 has authority support in addition to their part-time in-school technician.

In Authority C the IT Unit has recently been taken over by BT. This has caused some concern in schools. As mentioned each school has a technician attached to the school for two or three days per week but who will also support local primaries. Head teacher 7 mentioned variable levels of expertise and quality. One complaint was that there was no backup for the ICT technician officers if they were of poor quality or were ill. Librarian 11 felt it took time to get things repaired. Head teacher 13 considered that their technician was "invaluable" but that they could do with his working in the school full-time. Librarian 13 despite this in-school technician complained of major problems for him with a suite of computers in the library and nobody to put technical questions to.

Schools 6, 9 and 12 have a fully Managed Service so there are no authority technicians. In general these schools were more positive about technical support, however there were still areas of concern.

- legacy equipment is not covered by the current contract. ICT coordinator 12 has to deal with technical faults.
- Not enough technical staff had been employed initially to deal with problems although this has since been rectified.
- Concerns over cost in providing this level of service. Schools themselves could not pay for this.
- Time lag in getting technicians out.
- System slow and unstable.

Only head teacher 12 felt strongly about the need for an in-school technician whilst ICT coordinator 9 did refer to herself as a part-time technician.

School 8 also has a Managed Service Provider. They also have a problem of legacy equipment. However due to the presence of their own full-time school technician it was not a major issue.

15 Information skills provision

Most schools have now introduced courses for S1 (some also S2) which are generally provided by Computing and/or Business Studies. A general focus of these appears to be keyboarding skills and aiding pupils to become "confident and competent" users of ICT (eg School 1 and School 10). In one instance this course was to the detriment of the old library information skills course (School 14). A number of schools still made reference to what was being offered in the library as part of the information skills programme (1, 2, 4, 5, 12). School 14 have gone beyond what could be described as basic ICT skills and in addition to Wordprocessing and spreadsheets the ICT coordinator stated that "a good part of what we do is PowerPoint." He was keen to encourage staff to allow pupils to use PowerPoint as an option in their work presentation.

The other approach to information skills is to have a whole school programme where ICT is tackled within a range of curricular subjects. School 9 has taken such an approach. School 13 is intending to follow this for S1 and S2 where they will work out a programme for pupils that allows them to undertake a wordprocessed document, or an Internet search for curriculum work within S1 and S2. School 12 is currently undertaking an ICT audit of pupils information skills, the outcome of which may be to follow this approach. Mention was made of recent 5-14 guidelines on ICT which were initiating such approaches. "Transferability" of skills was mentioned as a concern and was an argument for a whole school approach.

School 8 provided a six week ICT course for S1 pupils in English. Only School 6 had no formal information skills course for pupils stating that pupils could get these in extra curricular activities such as supported study, computer club or Internet club.

16 Other information roles

It was considered important to show what other roles school librarians were undertaking within the school

Careers

All but librarians 5 and 12 managed a careers library. Librarians 2 and 10 had the greatest involvement. Librarian 2 talked of being "very heavily involved with careers." She gave careers talks to all S1 (an introduction to the careers library) and S2 (reinforcement and concerned with choosing subjects). For librarian 10 the use of the technology in the SLRC has increased her involvement in careers. The National Record of Progress was on the network but the head teacher stated "at the heart of it is the supported access available in the library." This was obvious during the interview when a large number of senior pupils were working in the SLRC on their Record of Progress and interrupted the interview on several occasions to request help. Librarian 10 participated in a recent HMI inspection of the careers library with the extra work which that entailed.

Librarian 6 had a lesser involvement but was responsible for four careers computers in the SLRC. Although librarian 13 did not say much about careers, the head teacher talked of the importance of having a knowledge of careers resources when asked about librarians' skills.

Staff Library

Although all but librarian 9 had a staff section there was little evidence that this had a significant impact on the role of the school librarian. Librarian 2 commented that use of materials had increased since making knowledge of their availability known over the intranet.

Supported study/Homework clubs

Librarian 3, 8 10 and 14 were all involved with supported study and homework clubs. Librarian 10 was the supported study coordinator for the school. She stated that she felt this was a "good role" for the librarian. It involved a diversity of after-school activities ranging from study skills, use of graphics, use of the fitness suite (S1), health topics (S2) and looking at areas of underachievement (S3). Senior pupils undertook more study support related to the SQA, whilst during the summer the new S1 could participate in revision support. Head teacher 10 talked of study support as a developing area for school librarians.

Librarians 14 also participated with a teacher in supported study. This was a limited course compared with School 10, in that it was only for third year pupils and ran for 10 weeks. Librarian 8 talked of a homework club based in the SLRC after school with which she assisted. In School 3 a small number of pupils make use of the SLRC for their supported study but there was no indication by the librarian that this involved a major commitment on her part. Librarian 6 had been involved in previous years in running the supported study but had opted not to be involved this year. None of these librarians used the intranet as an information resource to help with these clubs. Librarian 15 created the homework web pages on the intranet as his contribution to homework support. He did not physically attend the homework club.

Community use of SLRC

Only in Schools 6 and 10 did members of the community use the SLRC. Neither librarian implied that this had a major impact on their role. It was currently adult returners using the SLRC in School 10. An Information Unit was being built adjacent to the SLRC. It was expected that the community may make more use of the SLRC in the future.

Flexible learning

In School 1 "flexible Learning" was a major initiative just getting underway. The Unit would be part of the SLRC with the librarian responsible for supervising use of the technology. There was a suggestion that much of the material would be available on the intranet. At the time of the interview the librarian talked positively about the proposed plans. After the interview the researcher felt that further clarification on how the librarian would be involved with the flexible learning unit was necessary. The emailed response from the librarian showed that she herself was uncertain about the role: "I'm not too sure exactly what my role will be. Probably supervising resources and pupils who are accessing FL material. It's hoped that most of the material we use will be CD ROM or Internet based and tutor support will similarly be ICT driven. I'll probably also have some input into the range of materials in the FL center."

School library 14 housed a flexible learning center on the upper floor of the library. Although this was called the "flexible learning center" it was in essence all the computers in the SLRC and could be booked for class use or individual pupil research. It was used after school and at weekends by community services and local education colleges (the rest of the SLRC was closed). The librarian's role during the day did not appear to be any different to that of other librarians who had computers available for class use.

Distance learning

The librarians in Schools 3, 9, 10 and 14 had some involvement with pupils participating in distanced learning. It impacted on the SLRC due to resourcing needs and because pupils working on distance learning materials require access to the technology. For librarian 3 this meant that some of the machines were in constant use by senior pupils and restricted pupils coming from class for research work. None of the other school librarians made this complaint. In all schools the number of pupils undertaking distance learning was small.

17 Instructional websites: Further data

School 2 Holocaust site.

The instructional website has five sections-

1 - why the day is happening, why this day was chosen. Links to the following holocaust pages.

2 - three pupils worksheets resources page.

3 - a scan of all the books available in the LRC.

4- an events page with information on the video at lunchtime and an exhibition at another school.

5- a links page to relevant "holocaust" sites on the Internet

Religious Education (RE) classes in S2 spent an hour during Holocaust week on the worksheets, as did two senior English classes.

School 15 Instructional catalogue lesson

This included a number of screen dumps about how to do a search, with just enough description to help those who needed it. This was to be used within his information skills course.

Other school responses

Librarian 6 although responded positively stated that she would need "a little more expertise." But then added that she could see the ICT coordinator doing most of that "...but I think he would work with departments." Librarians 3, 4 and 7 replied "yes" to being asked if they would like to be involved in instructional websites. All had some training and potentially the skills to be involved. Librarian 7 did not find the skills side a worry. What was more concerning was finding the time as "it may well come down to the fact that if I want to go down the road of developing this sort of thing I might have to approach the head for an assistant." She also commented that "...it would have to be a collaboration between myself and departments." None of these librarians gave any indication that this was something they were actively working towards.

Librarians 9, 12 and 14 indicated they had at least considered instructional websites. Librarian 9 stated "yeh that is an excellent idea but it is just something that we haven't scratched the surface of. We're at the stage that we are actually starting to talk about something actually like that" He felt that the experience of building the front-end, of using FrontPage and an extra six months could see him at that stage. Librarian 12 was very interested and had thought about putting future versions of the library information skills course in that format. Librarians 14 after their NOF training had discussed the possibility of using study skills with the Geography Department as an instructional website for the new S1. Rather than a definite it was in terms of "hopefully" happening (but they were losing the intranet). In this school there was an instructional website on Physics on their public website. Both AHT and ICT coordinator were positive about encouraging use of these by departments. However neither made any connection to the librarian's role.

Although librarian 8 had been involved with instructional worksheets in her school, these have not been put on the intranet. "I can go along and you know they give me a search to do and ask me to find web pages for them and they know that I will then go along and help them set it up in a worksheet or something like that or some kind of format." These were done in Word or some other non-HTML format and went onto departmental space on the network rather than on the intranet. The librarian had not yet the specific skills to put them in a format for the intranet.

18 Specialist librarians and the School Library Service

In Authority E librarians were selected to be responsible for a different subject area. They would then search for and evaluate websites relating to that area of the curriculum. The school librarians would liaise with curriculum officers at headquarters in connection with the websites. The school librarians provided the URLs whilst the curriculum officers wrote the description related to the curriculum and put them into different levels, eg Foundation, General, Advanced. In order to get this initiative started the school librarians were offered training in Webdesign and graphics ahead of the NOF training. According to school librarian 2 this came about after the Director of Education had seen the school librarians' "Reading Web Site." Librarian 2 stated "he got to see it and thought ah these people really know what they are doing with doing lots of web design why don't we get the librarians to be the ones to do the subject pages for like a whole intranet for *the region*." Head teacher 3 stated "The authority continually suffers from good ideas which whether it be funding or the person dealing with it just lets it die a slow death so it may well devolve back to schools again but at the moment they are setting it up where each school has its own bit, the librarian was involved in that and all the school librarians have been given a subject or a couple of subjects to look after. History she is going to be looking at that..." Where there was a lack of information the school librarians worked with the subject specialists in creating their own materials.

Librarian 3 stated "I think the School Library Service have done a lot. I think they are the push behind a lot of the things that are going on with the librarians. But I think every school is at a different stage and it is very substantial across the whole region." What was required is "Maybe more on guidelines and what is expected of school librarians because we are all going our own way" (librarian 4).

Librarian 7 considered that because they were at the beginning of intranet development that was why the School Library Service had not been involved "What I could really do with is somebody who is, I mean you learn by somebody saying oh do you know that you can do this. So whether me going somewhere where there are up and running and wonderful things going on or seeing things or somebody coming out and showing me how you could do things in your place. I think probably going out would be better because you can see things in action, because you have got to see and bring it back."

School librarian 8 had had experience of support from a School Library Service prior to authority re-organisation. She stated "we have lost that you know somebody coming into the authority and saying yeh well this is the up and coming thing that we need to look at and there is nobody doing it...We need something which specifically is looking at new developments in school libraries."

School librarian 10 had just recently attended her first meeting in almost two years as a group of school librarians. She said that it "suited" most of the school librarians to be left on their own as most like herself were long-serving and "stable." However there was also concern voiced by the school librarians that the authority as a whole did not want to involve the librarians in the "curricular" side of developments. Doing that would be "setting a precedent." This recent meeting has been arranged to discuss the NOF training which is described as "desperately wanted" but the problem being that "within the training there is an expectation that we can be involved with the curriculum." The question of money and status was at issue. At the time of organising schools to participate in the research, another school librarian in the same authority declined to take part as the librarian was at that moment refusing to have anything to do with technology. There was no sign of an informal support system to help librarians in their use of technology within the authority.

19 Librarian qualifications and experience

School	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Sex	F	F	F	F	M	F	F	F	M	F	F	M	M	F	M
Time Qualified	6-10	0-5	6-10	10+	0-5	10+	10+	10+	0-5	10+	6-10	0-5	10+	10+	10+
Quals	Deg	Deg	PG	Deg	PG	ALA	ALA	Deg	PG	ALA	PG	PG	PG	ALA	Deg

Table 21. Characteristics of school librarians.

Deg = Degree in librarianship / information management

PG = First degree followed by a postgraduate course in librarianship / information management

ALA = Associate of the Library Association.

The most recent graduates are librarians 5 and 12. Both had been working for almost three years. Librarian 5 had worked in a secondary school in another authority for one and a half years and has now spent a similar time with his present school. Librarian 12, although new to the school, had spent three years in educational resource centres. The other recent graduates (2 and 9) had almost five years experience in the one school. Although many of the older librarians had spent a small amount of time in other schools most had worked for a lengthy period in the one school. The exception is librarian 13 who had only been at his current school for 1 year but who had been in secondary schools with that authority for many years. He was the only librarian to use length of time in school as a reason for not being involved in the intranet: "If I had been here for a few years it would probably be different. So basically being one person I have been trying to find my feet. And I have spent this year watching what is less appropriate and what is more appropriate and this year there has been a lot of watching going on..."

None of the school librarians interviewed had any teaching qualifications.
Librarian 5 was undertaking a distance learning course in computer based learning and teaching.
Librarian 9 had undertaken an MSC in online documentation after his post-graduate course.

It is considered that the sample in terms of experience in school librarianship and in terms of qualifications is representative.

Librarian 9 had accepted a post outside school librarianship at the time of the interview. Off tape librarian 5 talked of moving away from school librarianship within the next few years, whilst librarian 8 was actively looking for another post. Since the interviews took place the posts of librarian 4, 9 and 12 have been advertised nationally.

In School 14 the library characteristics refer to the full-time qualified librarian. The library assistant answered a number of the questions for School 14 as she was the most technically capable. School 11 employed job-share librarians. The interview was conducted with only one of these librarians. This was the most technically capable librarian who had been in post for the longer time.

20 Support in the School Library Resource Centre

Pupil helpers – 1,2,9,10,12

Part-time auxiliary assistance – 3,4,7,15

Part-time Library assistant – 5

Full time Library assistant – 14

None –6, 8,11, 13

Pupil helpers

Most talked in terms of traditional library duties.

Only in Schools 2, 5 and 15 did the librarians mention making use of pupil helpers in relation to the intranet. Librarian 2 had a group of sixth year prefects. "They are kind of doing some of the jobs for us like going out to departments and getting information from them and bringing it back." And "last week I was an employer in inverted commas with a work experience pupil on web design and we spent the whole week doing the social pages, the extra-curricular and sports clubs."

Librarian 5 had tried to encourage pupils to develop some of the content for the intranet. This had not worked as the pupils were not committed enough. This was similar in School 15. Schools 7 and 12 also made use of pupils helpers in developing the intranet but they had nothing to do with the librarian.

Part-time auxiliary assistance

Hours and duties varied

School 3 – Two and a half hours, three times per week- shelving and clerical

School 4 – Temporary part-time auxiliary

School 7 – Informal learning support auxiliary – only available to shelve books when not needed elsewhere in the school.

School 15- A Home Economics auxiliary helped in the SLRC one afternoon per week. There was also good will shown by support staff in the school, e.g. during the visit two learning support staff were cutting newspapers for the clippings folders. Parents help in the SLRC on occasions. The librarian considered himself stretched with shelving of books, chasing up of overdue and the more mundane "library" tasks were seen as low priorities

Part-time library assistant

School 5 had a part-time library assistant due to the fact that it was also a primary school. This library assistant was formerly the full-time librarian. When the intranet was being "populated" the local authority paid the library assistant increased hours for several months. The library assistant was also involved in the "editing" of information for the intranet and had been trained in FrontPage. The

library assistant did not have a role in "up-loading" the information or managing the content. This was left to the librarian.

Full-time library assistant

The library assistant in School 14 had originally been funded by the authority. Cutbacks had then meant the end of library assistants in schools. However this particular school has chosen to continue to fund a full-time library assistant from their own budget. This was one of the smaller schools.

Resources team / Technology Unit

None of the school librarians operated formally with other departments as part of a team (eg resources team, technology unit). However both librarians 2 and 5 in answering this question referred to their links with the Computing departments.

Need for more assistance

ICT coordinator 3 stated "there's a role I think perhaps for more help within the library so that the more mundane tasks the librarian had could be undertaken by auxiliaries." However it did not appear that the school intended to increase their auxiliary support. In discussing the future role of the school librarian ICT 4 says "I would hope that it would change further an increased role but I think we are very close to the limits of what one person can do. And if it is going to change and increase the ICT participation then we have to add some more support possibly at an auxiliary level to help assist in the library."

At the time of the interviews School 2 had no library auxiliary. The school librarian had been promised an auxiliary by the head teacher due to increased involvement in ICT. This information was confirmed in both ICT coordinator and senior management interviews. The DHT said "it was rather obvious to me that these people are under pressure and that we had to do something about it." "We are trying to be creative with time and what we can do to help in the school." The librarian in an email to the researcher six months after the interview stated that she now has a library auxiliary 4 afternoons a week: "I'm finding more time to be "creative" with our intranet now that my assistant takes care of the more mundane or time consuming tasks associated with being a school librarian."

School 11 had also been promised an assistant. According to the librarian this was due to the size of the school and to support the library generally rather than to work on anything associated with the intranet. The head teacher talked of the librarians being "bogged down with a lot of administration surrounding their job." However he also stated that he hoped that an assistant would enable the librarians to have more of a role "in learning and teaching and more of a role in intranet management and usage."

21 Number of networked computers in the School Library Resource Centre

School	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Actual	10	5	3	6	11	16	18	6	5	8	6	2	22	21
Total Planned	15	20	3+		20	20	18	6	5	12	8	8/10	22	21+

Table 22. Networked computers in the SLRC

The plus sign indicates that there are plans to increase the number of networked computers but that the number is not known. Only librarian 4 was unsure whether there would be any more computers provided.

Schools 8 and 9 have no plans to expand their networked computers due to lack of space. School 12 also talked of space problems but have firms plans to increase the number of networked machines to a "mini-suite" (ICT coordinator). In School 12 different final figures were given by the librarian and the ICT coordinator.

Four school libraries had enough machines to be used by a whole class of pupils. The number of machines in the library varied within the three authorities where there are three schools each. It is difficult to see whole authority strategies for computer access in SLRCs.

Publications

Carter, M. 2000, "Intranets in Scottish secondary schools: Authority Plans", *ComputerEducation*, vol. 95, no. June, pp. 10-14.

Carter, M. 2002, "The connecting school and the intranet librarian", *School Libraries Worldwide*, vol. 8, no.2 July.